

Economics of sustainability

Edited by

Ewa WÓJCIK

Tomasz ZIELIŃSKI



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ECONOMICS OF SUSTAINABILITY

Scientific publication



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Katowice 2022

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Introduction

Sustainable development issues have been playing an important part in today's business activity and have immense potential in contributing to the future economic and social development of the world.

They have gained momentum following dramatic changes in the natural environment that, if unattended, can lead to its devastation. The issues have been addressed at international and national levels resulting in regulations, policies and targets, as well as at the bottom level of individuals and business operating in local communities. The essence of sustainable development although clear is seldom realized by individual consumers. Similarly, activities towards sustainability definitely improve the company image while they are not likely to be one of the criteria taken into account by individuals making consumption decisions. This lack of awareness may result in consumers' ignorance of such beneficial actions and simultaneously in failure to provide positive feedback or support given to them.

The book is co-authored by researchers participating in the project "Economics of Sustainability" financed by Erasmus+ Action 2 Strategic Partnerships. Its Authors are members of the academia from six European countries, which provides for multi-perspective, international outlook. The Authors took a multidisciplinary, multinational and cross-cultural approach to the issues of sustainability bearing in mind that despite its global character there are specific local aspects that are core or particularly relevant in different parts of the world and Europe.

The myriad of aspects of sustainability range from cultural and social sustainability, through business and employment relations, marketing, CSR, sustainable production and consumption, sustainable finance and management, tourism, and hospitality industry to psychology and communication for sustainability. Comprehensive approach to the subject of sustainable development stipulates that general issues should be dealt with in parallel to country specific topics and incorporate different areas.

Modern technology proliferation plays the most important role in driving transition to sustainable development. Technology diffusion is the root of behavioral changes which, on the one hand, lead to new expectations of product and service providers and, on the other hand, empower consumers to such an extent so as they get involved in co-creating or even creating market offerings themselves. Therefore, today's and future generations of consumers need to be aware of potential threats to sustainability and measures that can be taken to solve the most urgent issues or mitigate the consequences of past actions or lack of care.

A variety of perspectives of the researchers contribute to interesting content with outstanding features. The book was written by researchers following their findings in the first phase of the project "Economics of Sustainability" and is targeted primarily to students and teachers as support material to study the subject mirroring the project title. It is based on the syllabus, which constituted the first output of the project, to enable and simplify the course completion. Moreover, as a downloadable open-access resource it can be used by representatives of other institutions and individuals worldwide.

The chapters cover introductory issues, the study of challenges for sustainable economy, and solutions towards sustainable economy.

Each chapter addresses economic, environmental and societal aspects of sustainability. The main focus is on identifying areas where sustainability issues are critical followed by discussion of measures already considered and to be taken in the future. The Authors included a list of learning objectives at the beginning of each part and conclude it by a number of discussion questions to be used in class to stimulate thoughts and creativity in looking for solutions to the most acute global problems.

*Ewa Wójcik
Tomasz Zieliński*

1



Introduction to sustainable development and entrepreneurship

Barbara Bradač Hojnik^a, Romana Korez Vide^a, Tjaša Štrukelj^a

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

- identify main challenges that are we facing globally today regarding the condition of our environment in connection to the economy,
- understand the concept of sustainable development and its main building blocks,
- understand the challenges of implementing sustainable development,
- understand the concept of sustainable entrepreneurship and its relation to sustainable development,
- get an overview of the measures to assess the implementation of sustainable development into society.

Introduction

Today we are facing the general challenge to satisfy all our needs. We are dealing with meeting needs that until recently we did not even know we had. At a time when the whole social system is established on the postulates of more, higher, better, this is perfectly normal. All this requires a huge number of resources. Here, however, we encounter the environment in which we live and its ability to keep up with the increased needs and expectations of people. We cannot successfully prevent and solve environmental and social problems if we do not have an idea of what the environment is, what the connection is between the

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environment and the economy. It is the understanding of the connections between people, especially their activity, and what is happening in the natural environment that is the key to a caring attitude towards the natural and social environment. The desired result is a state of society where living conditions and resources are used to continue to meet human needs without undermining the integrity and stability of the natural system.

The relationship between the business environment and the natural environment has received a lot of attention in the professional and academic literature over the last decades. Attention was drawn to the rapidly growing problems of ecosystems, while at the same time raising the question of the sustainability of the current economic system. Companies have entered an ecological crisis as a result of irresponsible environmental management in the past. Major changes are visible in the natural environment, the quality of which is deteriorating due to the irrational use of natural resources, encroachment on space and pollution. As ecologists have long warned us, catastrophic consequences await us in the future if we do not begin to correct our past mistakes and change the negative patterns of behavior that have led us to this state.

Sustainability and sustainable development

Challenges in society that cause unsustainability

The current economic model is facing major changes that are constantly testing its reliability and flexibility. Challenges include all the fears that members of environmental discourses have about the limits of growth and the carrying capacity of the planet. We are all aware that resources are physically limited and we need to think in the direction of changing the existing mainly linear economic models. The key challenges of the contemporary, also European economic model, related to sustainability are the growth of global population, increasing consumption and consequently use of resources, lack of resources, increasing pressures on ecosystems, waste growth, price and supply risks and globalization. All of them are interconnected and each of them is briefly discussed below.

Population growth

There are many concerns about population growth in connection with the debate on the limited availability of resources and the need for rapid action. This argumentation largely uses the data of the largest global collective organization of

countries – the United Nations, which with its professional institutions takes care of the preparation of reports in this area. Their data show that the world's population has doubled to the current 7 billion since the 1960s and is expected to grow in the future. It is estimated that the population will reach 9.6 billion in 2050 (United Nations [UN], 2019). There is a divergence in global population trends, because in some developed countries the population is declining, while in the least developed countries it is increasing rapidly. Their argument is also reinforced by data from European professional institutions, which emphasize that a growing population means that we are facing increased pressure on ecosystems and increased competition for resources (Kopnina, 2015).

Increasing consumption and use of resources

Continuing the argument is in the warnings that accelerated population growth and an ever-improving standard of living are leading to ever-increasing global demand for resources. The European Commission cites the following data in the expert basis for the adoption of a range of measures that lead to better resource efficiency: in the 20th century, the world's population increased by four times and economic results by as much as 23 times. We increased the consumption of fossil fuels by 12 times, the catch of fish by 35 times and the consumption of water by nine times. The extraction of material resources has increased by eight times worldwide, and the extraction of ores and minerals by 23 times. We currently pump 47 to 59 billion tons of minerals and raw materials a year. As a result, the Earth's climate is changing, fish stocks are declining, forests are shrinking, energy and critical land prices are rising and animal species are becoming extinct (European Council [EC], 2011). During this period, the annual growth of the economy was 2.3%. The total consumption of raw materials per capita varies greatly from region to region. Developed parts of the world are expected to have relatively constant domestic consumption of raw materials, while regions such as East Asia (with China) are expected to experience 270% growth in consumption and now have consumption very similar to European countries. Between 1980 and 2009, the extraction of natural raw materials (both organic and inorganic) is expected to increase from 35 billion tonnes to 68 billion tonnes. In 2009, each inhabitant of the Earth is expected to consume about 10 tons of raw materials. Of this, the share of non-renewable resources is estimated at around 70% (EC, 2011; Kopnina, 2016). International NGOs are also engaging in the discussion with findings and warnings that we are in a situation where the growth of the world's population, world production and consumption, which is rising sharply,

collide with the physical limits of our planet's capacity. We already use 70% of globally available water and 30% of energy for food production alone (WWF, 2014).

Lack of resources

All the above data are intended to highlight the limitations imposed on us by nature, which pose a threat to access to the necessary resources. The argument continues with future scenarios. The Ellen MacArthur Foundation, Europe's largest international professional organization working on alternative models of Europe's economic development, predicts that the extraction of natural resources such as metals, minerals, wood, soil and soil, drinking water, and otherwise by 75% globally. This is expected to lead to a major shortage of several rare elements such as gold, silver, indium, iridium, tungsten and other elements vital to industrial production (Ellen MacArthur Foundation [EMF], 2015).

Increasing pressures on ecosystems

Arguments in favor of the need for change of actual economic systems are also strengthened by findings on the poor state of the ecosystems. The European Environment Agency thus concludes that evolving consumption patterns will "continue to lead to a decline in global diversity and the impoverishment of natural ecosystems" (UN, 2019). A large proportion of protected species (60%) and habitat types (77%) are in an unenviable state of conservation. According to their findings, Europe is thus not meeting the basic goal of halting the decline of biodiversity by 2020, although it is achieving some of the more narrowly defined goals. The effects of climate change are expected to intensify in the future, and the main causes of declining biodiversity are unlikely to be addressed. (UN, 2015a; WWF, 2014). For example, the OECD (2020) estimates that 60% of the world's systems are degraded or unsustainable.

Economic losses and waste growth

We have previously listed all the challenges that follow the increased population growth and the consequent increased demand. The argument for change also goes in the direction of addressing the existing economic model. Different findings expose that the current economic model is surprisingly wasteful. This is confirmed by several analyses. For example, the total annual production in

OECD countries consumes more than 21 billion tons of raw materials, which are then not included in the products themselves (OECD, 2020; UN, 2015a). All of this leads us to the fact that room for maneuvering exists within the existing system. It is only necessary to deal with the optimization of individual parts of the system, which once again places argumentation in the reform environmental discourse.

Price risks

The next danger also relates to the need to resolve the conflict between the environment and the economy. Here, with the help of professional institutions, the very dangers that could also mobilize the economy or companies in the direction that things need to change. The positive connotation is also emphasized, which speaks of the fact that timely action can bring victorious business opportunities. Thus, the debate is moving in the direction of finding that resources and energy are becoming more and more expensive. Commodity prices rose by more than 150% between 2002 and 2010, and this trend is expected to continue. Raw materials and imported components represent from 40% to 60% of the total costs of European manufacturing companies (EMF, 2015). As a result, rising prices are expected to be a serious obstacle to their competitiveness. Businesses have recently become increasingly aware of the growing risks posed by volatile commodity prices and supply disruptions. The volatility of commodity prices can therefore be reflected in the stagnation of economic growth, mainly due to increased uncertainty, which inhibits investment and increases the costs associated with insuring against disruptions in the supply of raw materials. The most problematic is the rise in the prices of key resources, which have risen in recent years after a decade of declining in the long run (OECD, 2020).

Risks associated with supply

The following argument, like the previous one, again points to the dangers looming over businesses. The emphasis is on the fact that most parts of the world depend on imports of raw materials, as they do not have them in nature. Europe is thus said to be the largest importer globally, as the total value of raw material imports exceeds €760 billion per year, which is 50% more than the US imports (EMF, 2015). Europe will be more than 85% import-dependent in 2030. The situation with raw materials is said to be very bad, as it imports six times more raw materials than it exports. In European products, half of the raw materials are

supposed to be imported. The conclusion is that along with the increasing risk with the supply of raw materials themselves, the risks associated with supply are also increasing (UN, 2015a). The Ellen McArthur Foundation further points out that the security of supply of some resources is particularly questionable. More than half of the copper reserves are said to be located in countries with high political risks. Furthermore, around 80% of the land available for cultivation is located in countries marked by political risks or risks related to poor infrastructure. The same should apply to countries with about 37% oil and 19% gas reserves (EMF, 2015).

Globalization

Generally, the greater international integration of economies or globalization, offers many opportunities. Businesses have easier access to new and growing markets and sources of funding and technology. Consumers have a greater choice of goods at lower prices. However, globalization also means globalization of risks. In listing the challenges facing the European economic model, the fact is emphasized that globalization not only means that European society feels the effects of global trends, but also creates them. The consequences of the pattern of production and consumption in Europe can thus be understood from two aspects. The first one is the production aspect that addresses more broadly the pressures arising from resource use, emissions and the impoverishment of ecosystems in Europe. The second aspect is the consumption aspect, which focuses on the pressures on the environment resulting from the resources used or discharges associated with the products and services used in Europe – regardless of their origin. It is estimated that, on average, outside the EU, as much as 56% of land is associated with the production of products used in the EU (EMF, 2015).

All the aforementioned data should give a clear argumentation about the necessity of the transition to a different use of resources. It is becoming increasingly clear that resource efficiency is essential for further social and economic progress and to preserve the ecosystems' conditions. Consequently, we urgently need to focus on changing the perception of natural resources, changing consumer and production strategies if we want to maintain the future quality of life at least a comparable level. It is essential to achieve growth that is not based on using more new resources. It reflects the awareness that the European system of production and consumption must change radically in order to achieve the goal of the vision of Europe 2050, to live well within the borders of our planet (OECD, 2020).

Sustainable development

Sustainability emphasizes the goal, the tendency to preserve natural capital and the long-term (sustainable) operation of the economy and society as a whole. Sustainable development is ecological, social and economic development, and could be implemented at the local, national and international levels. Many emphasize that this is a balanced development, progress with environmental, economic, socio-ethical and cultural design.

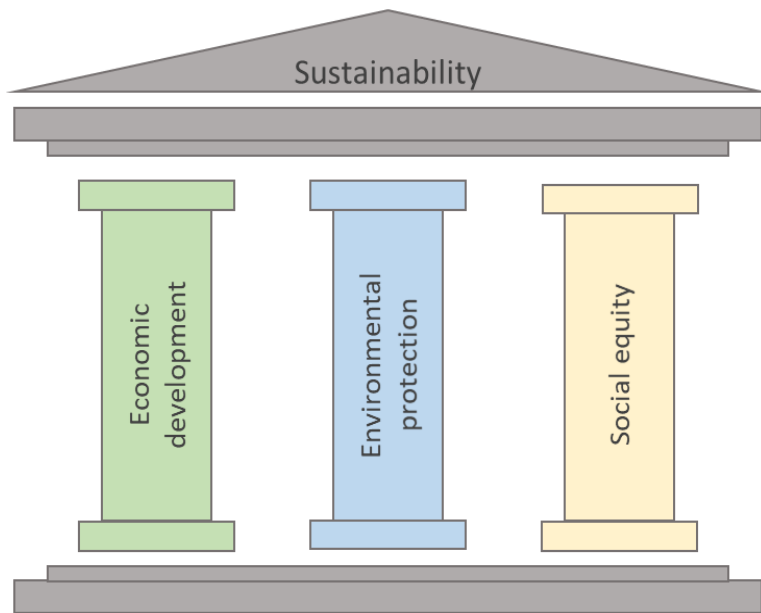
Many definitions of sustainable development are offered, given the specific emphases of the authors. The most frequently cited definition is from a report by the Brundtland Commission (1987): “Sustainable development meets the needs of the current human race without compromising the ability of future generations to meet their own needs” (EMF, 2015; UN, 2015a; European Council [EC], 2011). Additionally, different variations could be found in the literature, with all exposing the care for environment and humans with the emphasis on future (e.g., Cobbinah, Black, & Thwaites, 2011; De Clercq & Voronov, 2011; Emas, 2015; Hall, Daneke, & Lenox, 2010; Kardos, 2012):

- Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability goals address the global challenges, including poverty, inequality, climate change, environmental degradation, peace and justice.
- Sustainable development means, above all, finding and maintaining a balance between material well-being, social security and a healthy environment. It is inspired by natural ecosystems, which have proven in evolution that with their regulators they can maintain a dynamic balance and ensure survival even in the event of change.
- Sustainable development is understood as a structural (environmental, economic, social component of prosperity or progress), regional (regional coherence of development), planetary (taking into account the planetary consequences of local action) and ethical (intertemporal, intergenerational activity).

When discussing the sustainable development, we cannot avoid the concept of three pillars of sustainable development. Sustainable development can be thought of in terms of three pillars: the environment, the economy and society. It has also been known as “economic, environmental and social” or “ecology, economy and equity” (Cobbinah et al., 2011; Emas, 2015). Only when all three pillars are equally and evenly represented, we can talk about sustainable development. Sus-

tainable development therefore focuses not only on environmental issues, but also on social and economic ones. Figure 1.1 shows that the sustainable concept or development is achieved only by taking into account all three elements, social, environmental and economic, at the same time and equally.

Figure 1.1. Sustainable development pillars



As has been already exposed, the sustainable development is sustainably balanced, economically acceptable and it preserves nature. Sustainability is meant as a label for maintaining the capacity of the system of the economy and the environment to permanently meet the needs and desires of humanity and sustainable development should make this possible. When following the principles of sustainable development, it should enable and develop an economy that protects and respects living and non-living nature, an economy that does not accumulate anthropogenic substances in the planet's crust, atmosphere and near space, that does not change balance and will not affect our descendants or other beings on our planet (Dhahri & Omri, 2018; Gibbs, 2009). Concerns for environmental and social awareness and environmentally and socially responsible management and entrepreneurship are fundamental principles of sustainable companies that enable the balance of economic, social and environmental goals.

Promoting sustainable development with sustainable entrepreneurship

The basic condition for achieving sustainable entrepreneurship is that the companies operate according to the ideas of sustainable development. Thus, sustainable entrepreneurship and sustainable development are interconnected. Namely, the realization of sustainable entrepreneurship at the micro-level is reflected in the contribution to sustainable development at the global level. If we analyze sustainable entrepreneurship in the broadest sense, taking into account the theory of stakeholders, which includes and predicts the sustainable operation of all stakeholders, then their joint efforts to achieve sustainable goals at individual and business levels must be reflected as sustainable development on the global level.

The purpose of sustainable development and thus also sustainable entrepreneurship is the production of such products and services that enable their sustainable use (Cohen & Winn, 2007; Youssef, Boubaker, & Omr, 2018). In this way, we can achieve sustainable development in companies and, consequently, in the market and in society at large.

Companies can implement the principles of sustainable entrepreneurship in several ways, such as more economical use of natural resources, exploitation of renewable resources, non-pollution, careful radiation control, waste reduction, biodiversity, rational use of space and use of knowledge and technology (Shepherd & Patzelt, 2011; Shepherd, Patzelt, & Baron, 2013). In sustainable companies, however, different stakeholder groups achieve benefits. Among them, for example, employees can expect secure jobs, a regular and appropriately high salary, the opportunity for career development and education. Owners note that a sustainable company is not necessarily a highly profitable investment from a short-term perspective, but represents a safe long-term investment (Patzelt & Shepherd, 2011; Parrish, 2010). Suppliers, subcontractors, competitors and customers must also be adapted to sustainable entrepreneurship and business. In order for sustainable entrepreneurs to be able to contribute to the realization of the goals of sustainable development, it is important that they know and identify with them, and they must also know the concept of sustainable development.

Sustainable entrepreneurship

Entrepreneurship plays an important role in transforming society into a more sustainable one. Unlike for-profit entrepreneurship, which focuses primarily on economic component of the success, the purpose of sustainable entrepreneurship

is to focus equally on economic, social and environmental goals. Achieving economic, social and environmental effects refers to the so-called triple-bottom-line, where the achievement of economic, social and environmental goals must be balanced.

In recent years, the field of sustainable entrepreneurship has been developing intensively, so it is not surprising that there are different approaches to its research. In general, there are two approaches. The first approach is based on sustainable management and emphasizes the concepts of sustainable development and triple-bottom-line outcome, while entrepreneurial activities are subordinated to sustainable management. Another approach stems from entrepreneurship and links the triple-bottom-line outcome to the entrepreneurial process and emphasizes exploiting opportunities. According to the latter one, sustainable entrepreneurship represents the recognition, development and exploitation of opportunities of individuals to create products and services with economic, social and environmental benefits. Identifying, developing and seizing opportunities represents the entrepreneurial process and activities of sustainable entrepreneurship.

The concept of identifying and seizing opportunities is central to the literature that defines sustainable entrepreneurship and entrepreneurship in general. Identifying opportunities for sustainable entrepreneurship is associated with various market failures (Schaltegger, Wagner, 2011; Shepherd et al., 2013):

- a) businesses are not fully efficient,
- b) there exist externalities,
- c) pricing mechanisms are incomplete, and
- d) information is incomplete.

Entrepreneurs who notice one of the imperfections of the market and exploit it, have a greater chance of entrepreneurial success than other ones. The business opportunities of sustainable entrepreneurship are innovative products and services that improve social and environmental conditions, improve the efficient use of energy and natural resources, and exploit renewable resources that reduce costs, risks and are less harmful to society in the long run.

Entrepreneurial activity can be caused not only by economic (profit) motives but also by other motives, such as the desire for creativity and power or altruistic action. Both sustainability and entrepreneurship require innovation, which in both areas represents a new creative combination of existing resources. Thus, we come to the definition of sustainable entrepreneurship, which is fundamentally different from traditional entrepreneurship, namely to its goals (in addition to the

profit motive) adds the goal of sustainable living and contribute to improvement of the environment (Cohen & Winn, 2007; Riti, Dankumo, & Gubak, 2015). Therefore, sustainable entrepreneurship can be defined as discovering, creating, evaluating and seizing opportunities to create future products and services that would have a positive impact on society and the environment, make better use of energy and natural resources, and new (alternative) resources to enable cheaper production, at the same time, they would be less harmful to society. It consists of responsibility not only to investors and shareholders but also to nature, society and future generations, i.e., different groups of stakeholders. Sustainable entrepreneurship seeks to create value that benefits society by recognizing opportunities and exploiting them in an uncertain environment. This includes risk-taking skills, an innovative attitude and openness to new business opportunities, along with strong ethical concerns.

Elements of sustainable entrepreneurship

Sustainable entrepreneurship as a whole therefore contains three elements: people, the planet or environment and profit, also known as “triple P or 3P” (Dhahri, & Omri, 2018; Gibbs, 2009), shown in Figure 1.2. To be able to talk about sustainable entrepreneurship, these elements must be considered simultaneously and equally in the company. Taking into account all three key elements therefore follows the idea of meeting the needs of present generations without jeopardizing the needs of future generations, which represents sustainable development at the global level.

The elements of sustainable entrepreneurship shown in Figure 1.2 have the following characteristics (Dhahri & Omri, 2018; Gibbs, 2009; Hall et al., 2010):

- The first element, people, refers to the company’s policy of behavior towards its employees; this includes respect for human rights, that the company does not exploit child labor and does not engage in unethical and unfair work practices. It applies to all stakeholders of the company.
- The second element, the planet or environment, refers to the consequences of the company’s operations in relation to the use of natural resources and adverse effects on the environment. Namely, the protection of the ecosystem is an integral component of sustainable entrepreneurship and is also one of the most desired goals (in addition to achieving profit), which should guide the company throughout its operations.
- The third element, profit, is the main guideline of every company. As a component of sustainable entrepreneurship, we look at profit not only as a profit

that the company gives us, but also as a kind of capital that we can invest, invest in technology, research and development, and perhaps indirectly influence the preservation of the environment. and employee satisfaction. Therefore, from the point of view of sustainable business, the important way of use or profit sharing.

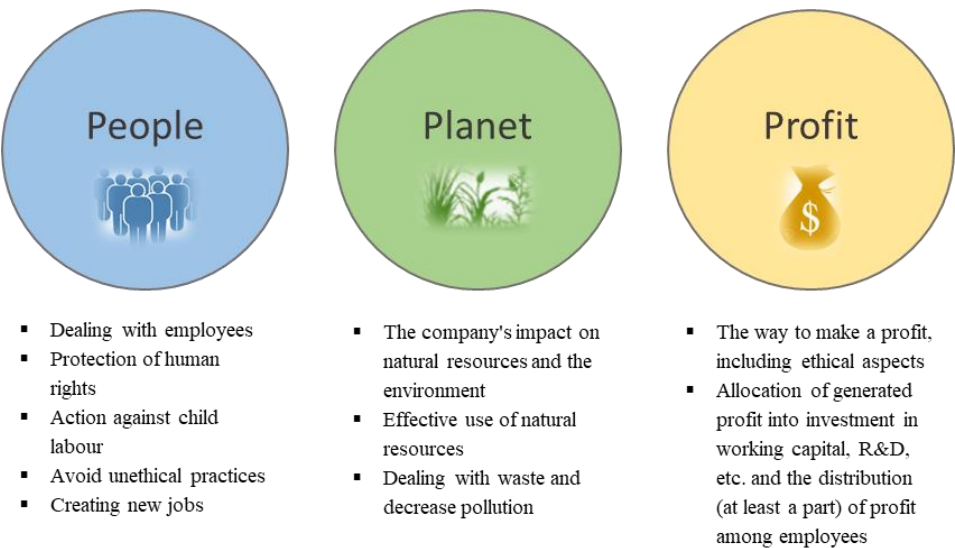
Figure 1.2. 3P of sustainable entrepreneurship



Source: University of Wisconsin Sustainable Management (2021).

The Figure 1.3 represents some examples of how companies could implement sustainable entrepreneurship principles into every day operations.

Figure 1.3. Examples of implementing sustainable entrepreneurship principles



The concepts of sustainability and profit-making have long been at odds, and this can be seen as the main cause of the debate on sustainable entrepreneurship. Although in the past the prevailing opinion was that sustainability primarily causes costs, today the inclusion of sustainability in the company's operations is considered a strategic decision in several ways (Cohen & Winn, 2007; Gibbs, 2009; Shepherd & Patzelt, 2011):

- a) When operating according to the principles of sustainable entrepreneurship or exploiting sustainable business opportunities, companies must follow the principles of sustainable entrepreneurship.
- b) Ethics: The company establishes, promotes, monitors and maintains ethical standards and practices in its relationships with all participants in the company.
- c) Management: the company consciously handles its resources carefully and uses them efficiently; of course, in accordance with the needs of all participants in the company.
- d) Transparency: the company has public information about its products, services, activities, and thus allows participants to make decisions based on the information provided.
- e) Business relationships: The company is committed to and promotes good and honest relationships with suppliers, distributors and business partners.
- f) Financial return: the company gives investors a fair return in return for their investment and protects the company's assets.
- g) Community participation/economic development: the company is committed to the common benefits of its own company and the wider community, which means that the company acts in accordance with the culture, context and needs of the community.
- h) Value of products and services: the company takes into account the needs, wishes and rights of its customers and strives to maximize the added value of products and services.
- i) Employment practice: the company promotes the work of human resource management, which supports the personal and professional development of employees, their diversity and gaining strength.
- j) Environmental protection: the company strives to protect and restore the environment and promotes sustainable development with its products, processes, services and other activities.

Measuring sustainable development

In 2015, the UN Summit on Sustainable Development adopted the 2030 Agenda for Sustainable Development, which represents a historic agreement by the international community to eradicate poverty, reduce inequality, ensure progress and protect the environment for present and future generations (UN, 2015a; UN, 2019). Respect for human rights and gender equality and ensuring prosperity, peace and security for all people and communities are also at the forefront of the new development agenda. The 2030 Agenda for Sustainable Development (UN, 2019) connects the three dimensions of sustainable development in a balanced way – economic, social and environmental – and intertwines them through the 17 Sustainable Development Goals to be achieved by 2030 (Figure 1.4).

Figure 1.4. Sustainable development goals



Source: UN (2015a).

An important feature of the new agenda is universality: its goals have been achieved by all countries of the world, both developing and developed countries. In 2000, world leaders pledged in the Millennium Declaration to work together for global development, and to this end adopted the eight Millennium Development Goals. The deadline for achieving these goals was set in 2015. The Millennium Declaration is considered to be the first internationally agreed framework for eradicating global poverty, hunger, disease, and inequality. According to the Millennium Development Goals Report 2015 (UN, 2015b), the goals have stimulated the most successful poverty eradication movement in human history.

Since 1990, which has been set as a starting point for monitoring progress towards the Millennium Development Goals, the number of people living in extreme poverty has fallen by more than half, and gender equality in education has improved significantly, as has in general (the representation of women in parliaments has almost doubled), the infant mortality rate before the age of five and the neonatal mortality rate have halved, and maternal mortality rates have fallen by 45%. Progress in reducing mortality from malaria, tuberculosis and other infectious diseases is remarkable. More than two billion people have been given access to adequate sanitation. However, the report points to uneven progress between regions and countries. The report highlights conflicts as the greatest threat to human development. Conflict-stricken countries often have the highest levels of poverty. Gender inequality also remains. There are still 800 million people living in extreme poverty and hunger. In the field of environment, global carbon dioxide emissions have increased by more than half since 1990, while water scarcity is already plaguing about 40% of the world's people (UN, 2015b).

The UN Summit on Sustainable Development adopted the 2030 Agenda for Sustainable Development in 2015 (UN, 2015c), which represents a historic agreement by the international community to eradicate poverty, reduce inequality, ensure progress and protect the environment for present and future generations. The 2030 Agenda for Sustainable Development connects the three pillars of sustainable development in a balanced way – economic, social and environmental – and intertwines them through the 17 Sustainable Development Goals to be achieved by 2030. An important feature of the new Agenda is universality: its goals were achieved by all countries of the world, both developing and developed countries. The new global goals lay new foundations in addressing inequality, economic growth, decent jobs, the challenges of cities and settlements, industrialization, energy, climate change, sustainable consumption and production, and peace and justice. The new development framework contains 17 sustainable development goals with almost 170 sub-goals. The key message of NGOs in preparing the new development agenda was that it should not leave anyone behind (UN, 2015c). Each of the goals is briefly presented in Table 1 from the perspective of European Union.

Table 1.1. Sustainable development goals

Goals <i>1</i>	Description <i>2</i>	Indicators <i>3</i>
Goal 1. To eradicate all forms of poverty worldwide	In the EU, indicators monitor and measure, in particular, progress in reducing multidimensional poverty and in ensuring that EU citizens can meet basic needs	<ul style="list-style-type: none"> 1.1. Level of risk of social exclusion. 1.2. At-risk-of-poverty rate. 1.3. Degree of serious material deprivation. 1.4. Level of very low work intensity. 1.5. Level of housing overload. 1.6. Proportion of population experiencing problems with leaking roofs, damp walls/foundations/floors or fragile window frames/floors
Goal 2. Eliminate hunger, ensure food security and better nutrition, and promote sustainable agriculture	In the EU, indicators monitor and measure, in particular, progress in the fight against malnutrition, in promoting sustainable agricultural production and in reducing the negative impacts of agricultural production	<ul style="list-style-type: none"> 2.1. Adult malnutrition and obesity. 2.2. Factor income index in agriculture to full – time labor force. 2.3. State budget funds for research and development activities intended for agriculture. 2.4. Share of agricultural land used for organic production or conversion. 2.5. Ammonia emissions from agriculture. 2.6. Gross nutrient balance on agricultural land
Goal 3. To ensure a healthy life and to promote general well-being at all stages of life	In the EU, indicators mainly monitor and measure progress in ensuring that conditions enable EU citizens to live healthily, by monitoring health determinants, causes of death and access to healthcare	<ul style="list-style-type: none"> 3.1. Life expectancy at birth. 3.2. General health status of persons. 3.3. Standardized suicide mortality rate. 3.4. Proportion of smokers (regular and occasional) among adults
Goal 4. To ensure quality education for all on an equal footing and to promote lifelong learning opportunities for all	In the EU, indicators mainly monitor and measure progress in primary, tertiary and adult education	<ul style="list-style-type: none"> 4.1. Proportion of children enrolled in (pre-school) education aged 4 to the age of entering compulsory primary education. 4.2. Early school leaving. 4.3. Population with tertiary education. 4.4. Level of employment of recent graduates. 4.5. Adult involvement in education. 4.6. Low level of literacy of students
Goal 5. Achieve gender equality and strengthen the role of all women and girls	In the EU, indicators mainly monitor and measure progress in reducing gender-based violence and strengthening gender equality in education, employment and leadership	<ul style="list-style-type: none"> 5.1. Gender pay gap. 5.2. Gender employment rate gap. 5.3. Proportion of seats held by women in the national parliament. 5.4. Proportion of women in management positions

Table 1.1. cont.

<i>1</i>	<i>2</i>	<i>3</i>
Goal 6. To ensure access to water and sanitation for all and to ensure the sustainable management of water resources	In the EU, indicators mainly monitor and measure progress in efforts to improve sanitation, improve water quality and use water more efficiently	6.1. Proportion of the population that does not have basic sanitary equipment in their household (baths or showers, flush toilets). 6.2. Population connected to municipal wastewater treatment plants with at least a secondary level of treatment. 6.3. Biochemical oxygen demand in rivers. 6.4. Nitrates in groundwater. 6.5. Phosphate in rivers. 6.6. Water utilization index
Goal 7. Provide everyone with access to affordable, reliable, sustainable and modern energy sources	In the EU, indicators mainly monitor and measure progress in reducing energy consumption, ensuring sustainable energy supply and improving access to affordable energy	7.1. Proportion of households that cannot afford a suitably heated dwelling. 7.2. Share of energy from renewable sources in gross final energy consumption. 7.3. Energy supply, final energy consumption. 7.4. Final energy consumption in households per capita. 7.5. Energy dependence. 7.6. Energy productivity
Goal 8. To promote sustainable, inclusive and sustainable economic growth, full and productive employment and decent work for all	In the EU, indicators monitor and measure, in particular, progress in promoting sustainable economic growth, increasing employment and providing decent work opportunities	8.1. Real growth of gross domestic product per capita. 8.2. Young people who are neither in employment nor in education or training. 8.3. Level of work activity. 8.4. Long-term unemployment rate. 8.5. Involuntary temporary employment
Goal 9. Build sustainable infrastructure, promote inclusive and sustainable industrialization and foster innovation	In the EU, indicators mainly monitor and measure progress in strengthening research and development and innovation and in promoting sustainable transport	9.1. Share of gross domestic expenditure on research and development in gross domestic product. 9.2. Employed in high and medium-high-tech manufacturing sectors and in knowledge-based service sectors. 9.3. Total number of persons in research and development. 9.4. Patent applications with the European Patent Office. 9.5. Share of public passenger transport in total land passenger transport. 9.6. Share of rail freight transport in total land freight transport. 9.7. Share of passenger car traffic volume by type of drive and fuel

Table 1.1. cont.

<i>1</i>	<i>2</i>	<i>3</i>
Goal 10. To reduce inequalities within and between countries	In the EU, indicators monitor and measure, in particular, progress in reducing inequalities between and within countries and progress in promoting safe migration and social inclusion	10.1. Gross domestic product per capita in purchasing power standards. 10.2. Adjusted gross disposable income per capita in purchasing power standards. 10.3. Relative poverty risk gap. 10.4. Gini coefficient of equivalent disposable income. 10.5. Share of total disposable income in the bottom 4 deciles (income per equivalent adult household member). 10.6. Number of asylum applications (total and granted)
Goal 11. To ensure open, safe, sustainable and sustainable cities and settlements	In the EU, indicators monitor and measure, in particular, progress in enriching the quality of life in cities and communities, progress in promoting sustainable transport and mitigating environmental impacts	11.1. Overcrowding rate in relation to the degree of urbanization. 11.2. Deaths as a result of transport accidents. 11.3. Exposure of the urban population to air pollution by particulate matter. 11.4. Proportion of households with noise problems. 11.5. Municipal waste recycling rate
Goal 12. To ensure sustainable ways of production and consumption	In the EU, indicators monitor and measure, in particular, progress in decoupling environmental impacts from economic growth, progress in reducing energy consumption and progress in tackling and managing waste	12.1. Generation of waste without mineral waste. 12.2. Waste recycling and disposal rate excluding mineral waste. 12.3. Material productivity. 12.4. Average CO ₂ emissions per kilometre for new passenger cars. 12.5. Volume of goods transport by gross domestic product. 12.6. Generation of food waste
Goal 13. Take urgent action to combat climate change and its consequences	In the EU, indicators monitor and measure, in particular, progress in mitigating the effects of climate change, in reducing climate impacts and in implementing climate initiatives	13.1. Greenhouse gas emissions. 13.2. Emission intensity from energy consumption. 13.3. Financing projects and implementing climate change mitigation and/or adaptation activities in developing partner countries
Goal 14. To conserve and sustainably use the oceans, seas and marine resources for sustainable development	In the EU, indicators monitor and measure, in particular, progress in efforts to protect the seas, progress in promoting sustainable fisheries and progress in keeping the oceans healthy	14.1. Proportion of bathing water of excellent quality. 14.2. Area of marine areas designated under Natura 2000. 14.3. Sea commercial fishing

Table 1.1. cont.

1	2	3
Goal 15. Protect and restore terrestrial ecosystems and promote their sustainable use, sustainable forest management, combating desertification, preventing land degradation and reversing this phenomenon, and preventing the loss of biodiversity	In the EU, indicators mainly monitor and measure progress in improving the state of ecosystems, reducing soil degradation and preserving biodiversity	15.1. Share of forest in the total area of the country. 15.2. Agricultural landscape bird index. 15.3. Area of terrestrial areas designated under Natura 2000
Goal 16. To promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and establish effective, accountable and open institutions at all levels	In the EU, indicators monitor and measure, in particular, progress in ensuring peace and personal security, in exercising the right to justice and progress in building confidence in the EU institutions	16.1. Mortality due to seizures. 16.2. Proportion of households experiencing crime, violence or vandalism in their area. 16.3. Total government expenditure on courts. 16.4. Corruption Perception Index. 16.5. Perceived independence of the judicial system. 16.6. Citizens' level of trust in the EU institutions
Goal 17. Strengthen ways and means to implement the goals and revitalize the global partnership for sustainable development	In the EU, indicators monitor and measure progress in consolidating the global partnership and improving financial management in the EU	17.1. Official development assistance as a share of gross national income. 17.2. Financing developing countries. 17.3. Imports from developing countries. 17.4. Gross government debt. 17.5. Share of environmental and labour taxes in total tax revenues

Source: UN (2015a).

The overview of all goals indicates, that there is a wide spectrum of different issues that needs to be addressed and achieved in order to improve the indicators. Therefore, sustainable development goals must be translated into a strong commitment by all stakeholders in the society to implement them efficiently.

Conclusions

Sustainable development is development that is sustainably balanced, economically acceptable and preserves nature. Sustainability is meant as a label for maintaining the capacity of the system of the economy and the environment to per-

manently meet the needs and desires of humanity, and sustainable development should make this possible.

First, we introduced several challenges of today's society, among which are the growth of global population, increasing consumption and consequently use of resources, lack of resources, increasing pressures on ecosystems, waste growth, price and supply risks and globalization. Because of introduced several challenges, we all individuals, organizations and societies have to start behaving sustainably.

As those unsustainable behaviors cause problems in the environment, we discussed an alternative of our future development, namely sustainable development. The concept of sustainable development provides an alternative to current economic behavior. It consists of the idea of simultaneously and equally balanced development on three segments, namely economic, social and environmental. As we found out in the chapter, we lack the implementation of those principles. To fully achieve them, we need to shift our values, attitudes and patterns of our behavior in the whole society. One of the implementational options is through development of sustainable entrepreneurship. Therefore, we discuss the concept of sustainable entrepreneurship, its elements and sources of opportunities. However, as we learned, there is a connection between different stakeholders in the society, which all have to add to changes to sustainable practices to fully achieve its benefits.

KEY TERMS

Sustainable development, sustainable entrepreneurship, unsustainability, measures of sustainability, sustainable development pillars, sustainable entrepreneurship elements, implementation challenges.

CHAPTER SUMMARY

The Subchapter provides the insight into main challenges that we are facing today, caused by the economic system which is not acting sustainable, and provides some possible solution for it. Among challenges are those connected to overexploitation of resources on one side and those connected to pollution on the other side of the linear production and consumption processes in the societies.

However, for several decades the sustainable development is emerging as an alternative to those processes. It exposes the need to consider all three pillars equally, namely social, environmental and economic. The main challenge remains on how to change our behavior and start to act more sustainably oriented and consequently implement principles of sustainable development globally. If we want to achieve it as a society, we have to implement those principles on micro level, starting with individuals and companies. Among companies, one of solutions is to implement principles of sustainable entrepreneurship which could help also to other stakeholders in society to act more sustainable.

DISCUSSION QUESTIONS

1. What are the challenges that are causing unsustainability?
2. How is the sustainable development defined and what are the pillars of sustainability?
3. How is sustainable entrepreneurship defined and what are the elements of sustainable entrepreneurship?
4. How are the concepts of sustainable development and sustainable entrepreneurship connected?
5. What are the challenges at measuring sustainable development?

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2



Diagnosis of the threats. Challenges for a sustainable economy

2.1. Environmental sustainability threats

2.1.1. Climate changes

Tadas Gudaitis^a

LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- identify key factors, sectors and pollutants that affect climate change,
- set climate change related risks,
- define international agreements and key achievements related to climate change,
- learn about circular economy, bioeconomy, green investments,
- know the tools for climate change mitigation.

Introduction

Climate change is one of the greatest challenges of our time. The changing climate is warming air and ocean temperatures, melting glaciers, raising global water levels, increasing the risk of floods, destroying animals and plants that are unable to adapt to climate change and impoverishing biodiversity. Climate change is leading to an increase in extreme weather events such as hurricanes, record droughts and heat, extreme cold.

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As the economy, the population and consumer consumption grow, emissions of greenhouse gasses (GHG) and other pollutants are rising. The countries are making great efforts to stabilize and reduce GHGs and other pollutants. They also have committed to the long-term goal of climate change mitigating so that global warming does not exceed 1.5°C. In order to achieve this global climate mitigation goal the agricultural, energy, transport and manufacturing sectors need to be fundamentally restructured, people's daily habits changed in order to promote energy efficiency, the use of renewable energy sources, waste management, reuse of raw materials, etc.

Climate change is a global issue

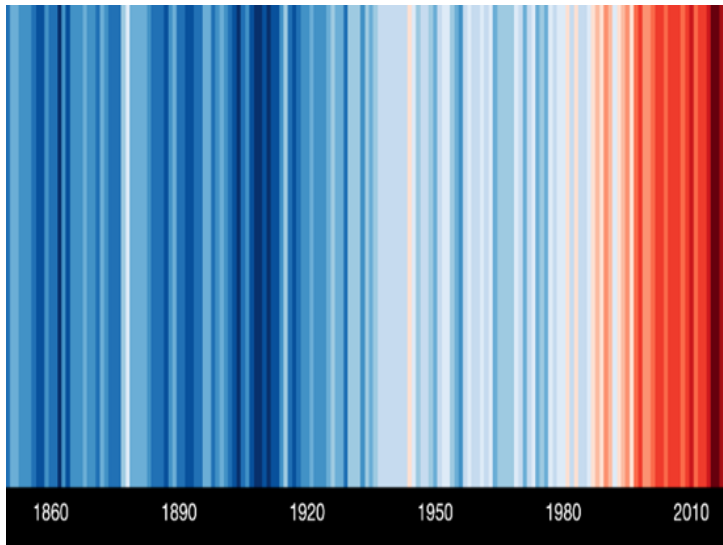
Climate change, as a significant problem affecting the whole world, requires being addressed and taking measures according its effects. Climate change leaves no part of the world untouched. It has a devastating effect not only on the world economic situation but also on the lives of individuals and their livelihoods, with the greatest impact on the weak developed countries.

Climate change is leading to major natural changes, such as increase in sea levels and weather conditions that become out of control. Almost all of the last twenty years have been marked as the warmest in the 21st century. Human activities have caused around 1°C of global warming and we are facing changes in weather and climate extremes, and temperatures continue to rise. Climate change is a threat that can affect EU and the world security and prosperity, including economic, food, water and energy systems.

According to the climate scientists the planet is heating up (Karki et al., 2019; Khan, Ahmad, Ahmed, & Iftikhar Hussain, 2021; Mills, Krause, Scotese, Hill, Shields, & Lenton, 2019). In the Figure 2.1 the change in temperature all over the world from 1850 to 2017 is presented.

The picture (Figure 2.1) above demonstrates the change in temperature all over the world: each stripe has its color which corresponds to the temperature in the indicated year. Scientists have concluded that this was caused by the emissions of greenhouse gases which have significantly increased due to the human activities, such as carbon dioxide (CO₂). Assuming that these emissions are spreading at the same rate, the temperature of our planet is projected to be 4 degrees higher by the end of the 21st century.

Figure 2.1. Annual global temperatures from 1850-2017



Source: Hawkins (2018).

There is an obvious connection between carbon emissions, global warming and sea level rise. Even if carbon emissions start to decrease all over the world, our planet would still warm for some time because of the inertia of the climate system. The average global ocean temperature has been observed to have risen to a depth of at least 3 kilometers since the 1970s. From then until 2003, the global average sea level rose by about 2 mm annually. Climate change is causing sea levels to rise for two reasons: the expansion of seawater due to warming oceans, which in turn are warming due to rising temperatures around the world, and melting glaciers whose water enters the ocean. The data illustrate the strong impact of global warming on sea level rise, if the global temperature warms by 1.5 degrees, the global average of sea level will increase by 48 centimeters and more than 46 million people will be affected. If the global temperature warms by 2 degrees, the global average of sea level will increase by 56 centimeters. If the global temperature warms by 3 degrees, the global average of sea level will increase by more than 7 meters. In case if the global temperature warms by 4 degrees, the global average of sea level will increase nearly 9 meters and 470-760 million people will be at risk (Hawkins, 2018). If we do nothing, climate change will increase global temperatures by more than 3°C, thus affecting all ecosystems, which also include human beings.

Climate pollutants

When starting to study climate change, it is simply necessary to understand the damage caused by different pollutants that can be occurred through natural processes (forest fires, volcanic eruption, dust storms, etc.) or through human activities (auto, agriculture, industries, etc.). These pollutants contaminate every area of the environment and make these areas unsafe and unsuitable to be used. Greenhouse gases (GHG) do not release the Earth's heat from the atmosphere, which raises the temperature and thus causes climate change, such as extreme climate events, rising sea levels, human illness and death.

The main greenhouse gases met in the atmosphere are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (NO), ozone (O₃), and chlorofluorocarbons (CFCs) – Figure 2.2.

Figure 2.2. Greenhouse gas emissions in EU and the world in 2017



Source: European Parliament (2019).

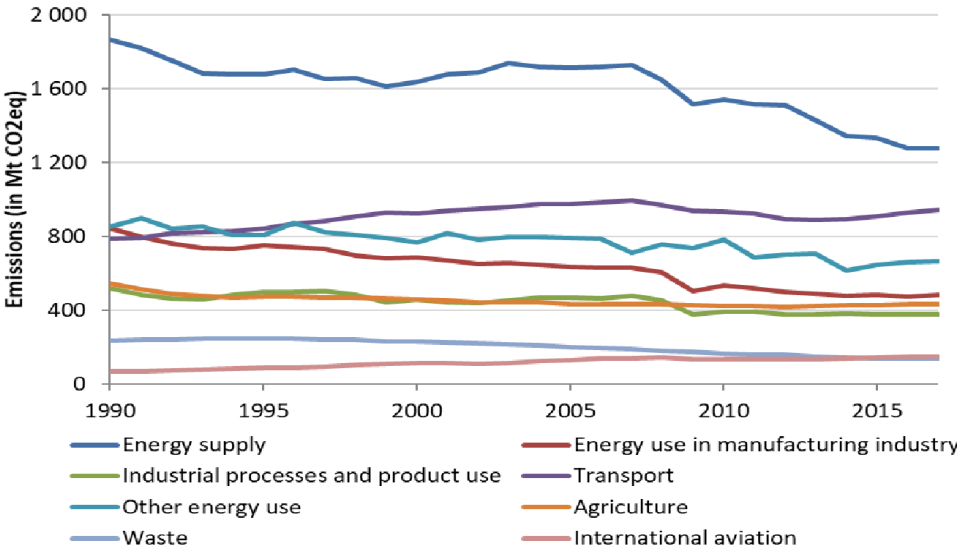
As the picture above shows, CO₂, which is produced by human activities, is the main emitter of greenhouse. All other greenhouse gases are emitted to a lesser extent. It has been observed that CO₂ emissions have fallen by 22% in the last almost 30 years (1990-2017). This is because in 2016, EU energy consumption was 2% lower than in 1990. Such a decline was found between 2006 and 2014, when the primary consumption reduced by 12% over the period and the final demand reduced by 11%. Unfortunately, energy consumption started to rise again later due to factors such as the increasingly cold winter, continued economic growth, falling fuel prices (European Commission, 2018b).

Many good initiatives are already being implementing in order to reduce energy consumption, greenhouse gasses emission but that is not enough. In recent years, the European Union has pursued policies to combat climate change by trans-

forming the energy industry. The cost of renewable energy technologies has fallen due to ongoing support programs around the world. The conditions for using solar and wind energy and electricity storage technology have clearly improved in recent years. The electricity power sector has taken an extremely important step towards decarbonization with the growth of renewables and the contribution of nuclear. This led to a 26 % reduction in greenhouse gas emissions from the electricity power sector in 2005-2016.

The infrastructure created allowed for the wider use of renewable electricity. This has been done, for example, through the interconnection of areas with complementary renewable energy sources, or through the inclusion of offshore wind parks in transmission networks. Renewables have also played a major role in industrial processes and heating in buildings, and between 2004 and 2016, their share almost doubled in the heating and cooling sector. Biomass remains the largest contributor of energy. Other renewable heat solutions such as heat pumps, biogas, solar thermal technology have demonstrated their rapid growth only in the last decade. The EU is the industry leader in renewable heat technology, ranking second in solar thermal capacity installed and first in solar district heating. Total EU transport emissions accounted for almost 26% of total emissions. The transport sector is very important in terms of energy and climate (Figure 2.3).

Figure 2.3. EU greenhouse gas emissions by sector 1990-2015



Source: European Commission (2018a).

Greenhouse gas emissions arising from transport continue to increase and it remains challenging for air pollution. International aviation is responsible for 3% of the EU's gross greenhouse gas emissions. Air transport emissions have grown more than twice since 1990 meanwhile emissions from road transport decreased. These emissions have decreased due to the fact that transport has evolved and many improvements have been made in energy efficiency of both land and air transport. In 2016, the EU's share of renewable energy in transport was 7.1%. Biodiesel is of great importance in the field of renewable energy for transport. Renewable electricity in transport has been significantly increasing recently.

Another crucial sector of economic activity related to greenhouse gas emissions is industry. Activities in this area account for 16% of the EU's Gross domestic product, and the emissions caused by it reach about 15% of total greenhouse gas emissions.

Greenhouse gas emissions from waste declined from 1995 to 2016. This decrease was mainly due to the EU waste legislation. The EU Waste management provides priority to recycling and energy recovery. A quarter of all greenhouse gas emissions come from agriculture and other sectors of land use and this share is likely to grow.

Agriculture sector makes a significant impact on instabilizing global temperatures.

In summary, for global temperatures to fall by 2⁰C degrees, it is simply necessary to transform the systems of industry, energy, food, transport and many other areas around the world. To meet the climate change issues, it is essential to provide legal, financial and social measures at EU and national levels (European Commission, 2018b).

Greenhouse gases are one of the most important pollutants of the atmosphere, however, there are other types of pollutants that contribute no less to climate change. It should be discussed more issues related to land, water and air pollution.

Land or soil pollution. Household garbage such as paper, plastics, rubber and other materials as well as industrial waste are the ones that can pollute and cause serious harm to the land. Much of industrial waste is considered as non-hazardous (for example, wooden materials, etc.) and another part of waste is defined as toxic waste (for example, surgical tools, etc.). Land polluters may be distinguished:

- **Landfilling.** This is the oldest way of disposing of unusable goods and garbage by burying them underground. The location becomes a landfill, and as a result of the waste disposal process, it becomes a massive source of pollu-

tants, destroying all surrounding soil. Landfills are also an excellent choice for storing waste until it can be recycled or incinerated.

- **Industry.** The manufacturing industry is very important for most of the countries, but it is also linked to the development of tons of toxic materials from waste.
- **Agriculture.** Agricultural production is boosted by preserving and improving soil fertility, especially in terms of organic content and water retention ability. Soils, as well as their biomass, nitrogen, and phosphorus content, are crucial for mitigating climate change. To address some of the challenges, a number of good soil management practices have been developed; however, there are significant knowledge gaps, such as the factors affecting their fertility functions, such as their capacity to store carbon, which varies depending on climate and environmental conditions. The European Union has set ambitious goals to combat climate change, including a carbon-neutral economy by 2050. To resolve current fragmentation and unleash the ability of agricultural soils to contribute to climate change mitigation and adaptation while maintaining or growing agricultural functions, Europe needs an integrated system for soil research.
- Any liquid, solid, or sludge waste that contains properties that are unsafe or harmful to human health or the environment is classified as hazardous or toxic waste. Toxic waste is any substance that, when inhaled, ingested, or absorbed through the skin, may cause damage. Toxic waste is waste that includes heavy metals, radiation, and other chemicals and comes from industries such as manufacturing, agriculture, construction, laboratories, and hospitals. Cell phones, laptops, televisions, and solar panels all contain harmful chemicals that can damage the environment if not properly disposed of to avoid contamination of the air, soils, and water. Mining, petroleum refining, pesticide manufacturing, and other chemical processing all produce hazardous waste. Paints and solvents, motor oil, fluorescent lights, aerosol cans, and ammunition are among the hazardous wastes produced by households.
- **Deforestation.** Deforestation is the systematic destruction of trees in order to make room for something other than woodland. Clearing land for agriculture or grazing, as well as using the timber for fuel, building, or manufacturing, are examples of this.

The negative process of land pollution can be controlled by reducing amount of household rubbish, recycling, reusing.

Water pollution. Water is the foundation of all creation. When chemicals or toxic foreign substances are added to water, contamination occurs. Domestic sources (detergents and sewage, agricultural wastes containing chemicals like fertilizers and pesticides, and so on) and industrial wastes containing hazardous substances like acids, oils, and so on pollute water. Water contamination is linked to a number of serious health issues, such as dysentery, malaria and also an environmental problem for eco systems. Water pollution can be controlled by minimizing the use of detergent, setting wastewater treatment plants, etc. The main pollutants of water are:

- **Agricultural.** Agriculture is the leading source of water contamination all over the world.
- **Sewage and wastewater.** Wastewater is the kind of water that is used. It comes from commercial, manufacturing, and agricultural operations, as well as showers and toilets (think metals, solvents, and toxic sludge). Stormwater runoff refers to the accumulation of road salts, tar, grease, and contaminants in stormwater runoff.
- **Oil pollution.** Land-based sources such as factories, fisheries, and cities account for nearly half of the total 1 million tons of oil. Tanker spills account for about 10% of the oil in the world's oceans, while routine shipping activities contribute about one-third.
- **Radioactive substances.** Any contamination that releases radiation in excess of that naturally emitted by the atmosphere is classified as radioactive waste. Uranium mining, nuclear power plants, the manufacture and testing of military weapons, as well as universities and hospitals that use radioactive materials for research and medicine, all contribute to the pollution. Radioactive waste can last thousands of years in the atmosphere, making disposal a huge challenge.

Water pollution kills and makes ill. Reduce plastic use and reuse or recycle plastic, properly dispose of chemicals and oils, maintain vehicle so it does not leak gasoline, antifreeze, or coolant, and stop using pesticides and herbicides are only a few easy ways to prevent or at least restrict contribution to water contamination.

Air pollution. When substances that are not naturally present in the air are introduced, air pollution occurs. Some of the sources of air pollution are natural (for example, volcanic eruption, forest fires, dust storms, etc.) and some are human-made pollutants. Dangerous chemicals, such as carbon monoxide, nitrogen oxides, and chemical vapors, are another common form of human-made air pol-

lutant. Another common form of human-made air pollutant is dangerous chemicals like carbon monoxide, nitrogen oxides, and chemical vapors. Finally, air pollution can take the form of greenhouse gases, which are responsible for the greenhouse effect, which causes the Earth to warm. These air emissions contribute to global warming, which raises the Earth's temperature. Carbon dioxide decreases the ability of oxygen in the blood, while sulfur dioxide and nitrogen oxides cause acid rain, which harms plant life and degrades soil quality – these are other effects of air pollutants on us. As a result, measures must be taken to avoid air pollution. The release of contaminants into the air which are harmful to human health and the environment as a whole is referred to as air pollution. Air pollution is caused by the use and processing of energy. There are many forms of pollutants in the air:

- Smog and soot. These two forms of pollution are the most common.
- Hazardous air pollutants. Even in small quantities, these are either fatal or pose serious health risks. Almost 200 are limited by regulation, with mercury, lead, dioxins, and benzene being among the most common.
- Greenhouse gases.
- Pollen and mold. Mold and allergens from the greenery are also carried in the air, exacerbated by climate change, and pose a health risk. They are not monitored by the government and are not as closely linked to human activity as other contaminants, but they can still be considered air pollutants.

In line with information above the origin of climate pollutants can be natural or caused by human activities and the latter are the most toxic and have the most negative consequences.

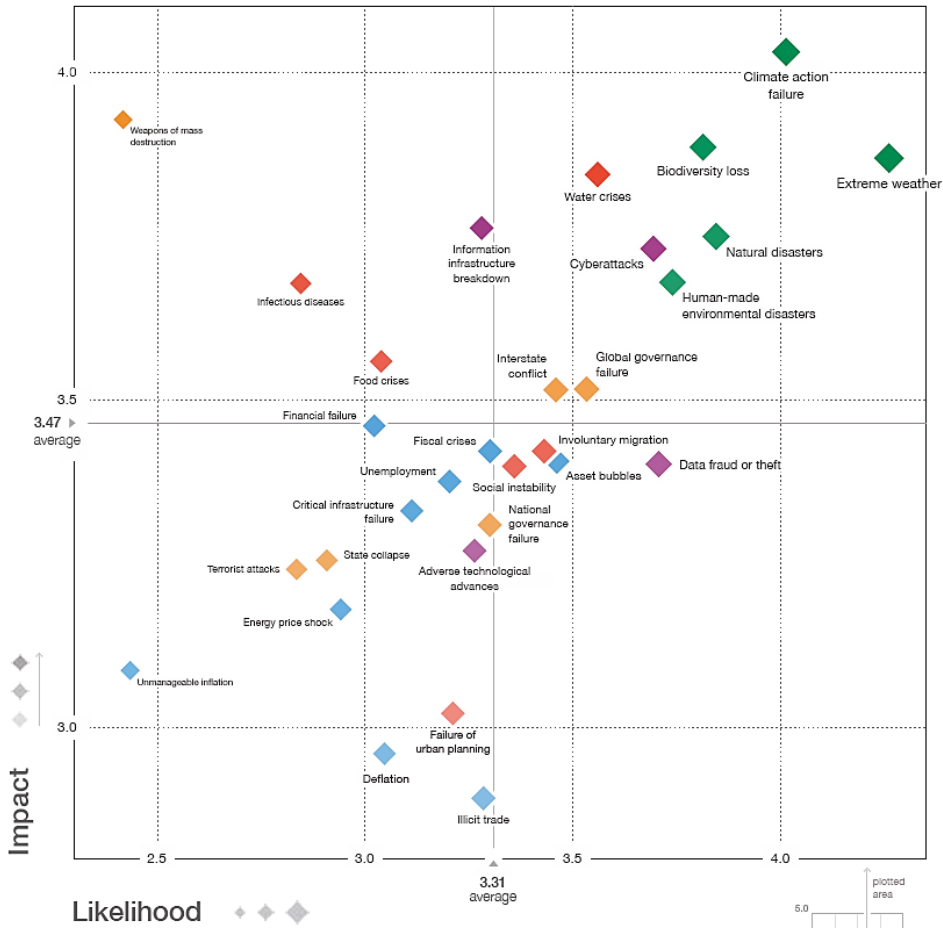
Climate risks and management

Climate change is evident and is largely driven by rising greenhouse gas emissions and other pollutants that will definitely lead to climate change risks to human and whole ecosystem. The following information provides climate risks that may affect society, economy, environment.

Climate-related problems dominated all five of the top long-term risks in terms of probability in 2020 (World Economic Forum, n.d.; cf. Figure 2.4):

- **Climate action failure.** Climate action is one of the Sustainable Development Goals (SDG) set out in the United Nations' Agenda 2030 for Sustainable Development, which was adopted in 2015. Climate action failure, or the failure to mitigate and adapt to climate change, is identified as the top global danger.
- **Biodiversity loss.** Climate change is the greatest potential danger to plants and animals. Despite the actions taken by the majority of the world's countries in Paris in 2015 to balance the global atmosphere, the world's climate continues to warm at an alarming pace. The establishment of protected areas is the primary aim for ensuring biodiversity. The most critical thing that can be done to save nature in the twenty-first century is to keep global warming below 1.5 degrees Celsius.
- **Extreme weather.** Extreme weather events such as extreme heat, drought, extreme flooding, tropical storms, and hurricanes have an effect on society and ecosystems in our current environment, and the likelihood of extreme weather events is increasing as climate change occurs. Most of extreme events that trigger loss each year is influenced by both evolving human factors, such as population growth and infrastructure expansion, and natural climate variability. Warm temperatures and heavy rainfalls have been observed to occur more frequently. Continued climate changes will cause both more extremely dry periods and more heavy rainfall events.
- **Natural disasters.** Tsunamis, tropical cyclones, hurricanes, droughts, and wildfires are becoming more severe and widespread as a result of climate change. Every country in the world is seeing the drastic effects caused by climate change, some more than the others. The loss of polar ice is hastening the rise of sea levels and threatening coastal communities. Severe weather is getting worse: the recent years saw unprecedented wildfires and devastating storms all over the world, as well as Arctic sea ice loss and record-breaking heatwaves in Europe.
- **Human made environmental disasters.** Human-caused environmental disasters are characterized as human-caused damages to the natural environment that result in disease and death of living beings, including plants, animals, and humans. For instance, the worst human made environmental disasters ever was Chernobyl nuclear disaster in 1986.

Figure 2.4. Global Risks Landscape 2020



Source: World Economic Forum (n.d., p. 3).

The effects of climate change contribute to a “state of emergency” in the world. The complexity of the climate system means that some of climate change impacts are still unknown, such as (World Economic Forum, n.d., pp. 6-10):

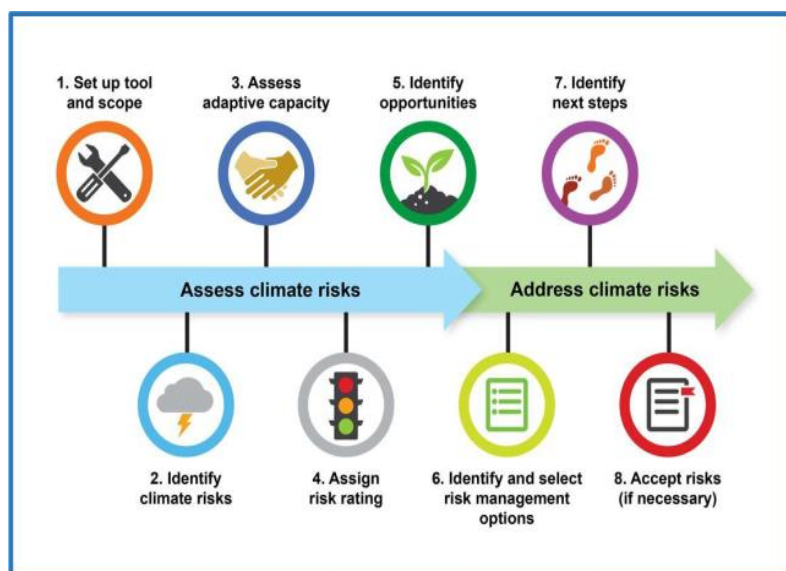
- Loss of lives. Natural disasters kill 14 times more women and children than men, and natural disasters are becoming more common as a result of climate change. The aged and infirm are also more vulnerable. Climate change would also devastate health systems, particularly in the poorest and most vulnerable countries, such as many low- and middle-income countries.
- Impact on ecosystems. The wellbeing of fragile marine organisms is being harmed as the oceans get warmer, stormier, and more acidic. Low-lying areas

will be flooded as glaciers and ice sheets melt. Climate change is expected to affect three times as many people by 2050 as it does in the past.

- Food crises. Crop yields will double production by 2050 in order to meet increasing demand for food. Given that agriculture, livestock, and deforestation account for nearly a quarter of global emissions, more productive land use is needed. It is one of the most promising carbon-sequestration possibilities. Water scarcity will worsen, already affecting a fifth of the world's population.
- Increased migration. Extreme weather events such as flooding, hurricanes, wildfires, and hot temperatures forced over 20 million people out of their homes each year between 2008 and 2016. As sea levels rise, more people will be forced to flee their homes in low-lying areas, resulting in an increase in the number of refugees.
- Geopolitical changes. Security and access to common property resources such as fishing waters will become more important issues as a result of climate change. Melting sea ice will disrupt existing shipping routes and open up new ones.
- Economic impacts. Natural disasters caused US\$165 billion in economic damage worldwide in 2018, with half of that amount uninsured. Climate-related economic harm in the United States could exceed 10% of GDP by the end of the century. Climate-related losses will be distributed unequally across countries. Big economies bear the highest economic costs, while smaller economies bear a higher risk of mortality and non-economic costs.
- Capital market risks. The global capital market is at risk from climate change as a systemic risk. Individuals and businesses can find insurance unaffordable or inaccessible as severe weather events become more frequent.
- Disruption of trade, labor and supply chain. Climate change would have an effect on trade by causing price distortions and disrupting supply chains. The labor force will be affected as well.

Regarding the discussed consequences of climate change relevant policy decisions, activities, finance and methods that should be used by individuals, organizations, and institutions to facilitate climate-resilient are necessary. It is important to ensure proper climate risk management in the background of climate change (Figure 2.5).

Figure 2.5. Climate risk screening and management tools



Source: USAID (2017).

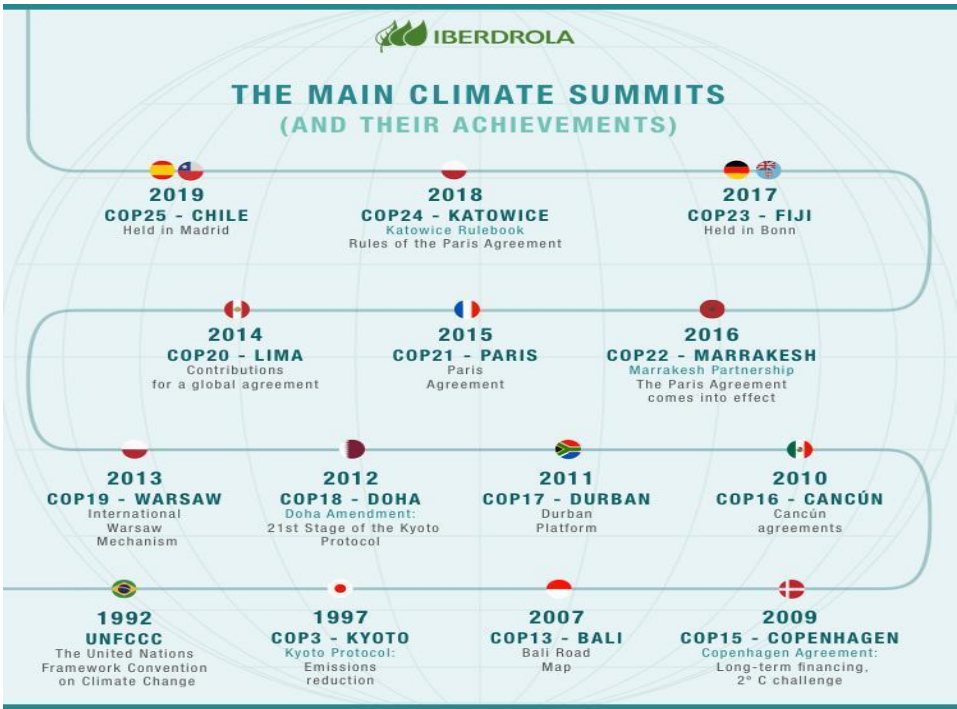
The need to resolve the dangers posed by climate change has resulted in a range of measures such as international agreements, different programs and finance. Global climate-related financial flows increased by 17% from 2013 to 2016, owing largely to \$681 billion in private investment in renewable energy. In 2016, investment in fossil fuels was \$781 billion, which was higher than investment in climate-related activities. A much larger scale of annual investment is needed to achieve a low-carbon, climate-resilient transition. Climate adaptation and resilience activities were included in at least 120 of the 153 developed countries' national adaptation plans in 2019 (European Commission, 2018b). The large budget allocated to climate actions and investments illustrates the high risks that climate change may cause.

International agreements and achievements related to climate change

In order to manage climate related risks is important not only to allocate funds efficiently, but also to have a common vision, legislative, agreements in the fight against climate change. Let's make a brief overview of the most important inter-

national agreements and key achievements related to climate change. The main climate summits are presented in Figure 2.6.

Figure 2.6. The main climate summits



Source: Iberdrola (n.d.).

The most important climate summits are: The United Nations Framework Convention on Climate Change, The Kyoto Protocol and The Paris Agreement.

The United Nations Framework Convention on Climate Change (UNFCCC) was created in 1992. Today, it has been ratified by 197 countries and is defined as the first global commitment for global warming and it has established the bases for international accords on climate change.

The Kyoto Protocol was signed in 1997. It is an international agreement that aimed to reduce CO₂ emissions and the presence of greenhouse gases (GHG) in the atmosphere. The essential goal of the Kyoto Protocol was to reduce the amount of industrialized nations CO₂ emissions.

The Paris Agreement is an agreement within UNFCCC dealing with greenhouse gas emissions mitigation, adaptation, and finance signed in 2015. The text

of the Paris Agreement contains all the elements for the global strategy on climate change for the post 2020 period and the period prior to 2020 being covered by the second stage of the Kyoto Protocol (the Doha Amendment). The Paris Agreement sets a global goal to avoid global warming more than 2°C and makes efforts to limit warming to 1.5°C. It is also targeting to combat climate change and to accelerate and intensify the actions and investments for a sustainable low carbon future, to increase the ability of countries to deal with the impacts of climate change and to make finance flows consistent. The Paris Agreement notes the importance of taking action to ensure the integrity of all ecosystems and the protection of biodiversity in the context of combatting climate change and adapting to its impacts. An improved understanding of the interactions and feedbacks between ecological processes and climate change is crucial for the development of appropriate solution oriented strategies and measures for biodiversity conservation and cost effective ecosystems based climate change adaptation and mitigation. Furthermore, there are opportunities to let biodiversity and ecosystems benefit multidimensionally from climate change adaptation and mitigation, because intelligent climate policy can simultaneously reduce other environmental stresses, such as air pollution.

Climate change mitigation, adaptation, and ecosystem services are all supported by good climate-related management. October 7, 2020 the European Parliament voted for a more ambitious target of 60% carbon emissions reductions by 2030, moving closer to science and away from politics. But this still falls short of what is necessary to fight the climate crisis. In what many called as a “historic moment” in Brussels politics is 60% carbon emissions reduction target to be achieved across Europe by 2030.

The most significant climate change agreements can be summarized as follows:

- the aim for developed countries to contribute \$100 billion to climate-related programs in developing countries,
- the goal of keeping global warming below 2 degrees Celsius,
- working toward a post-2020 global climate agreement that is legally binding and raising climate commitment rate before 2020,
- The Marrakesh Partnership for Global Climate Action is a forum for engaging the general public and increasing their participation in global climate action.

The United Nations 2030 Agenda for Sustainable Development is a plan of action for people, the planet and prosperity. All countries and all stakeholders acting in collaborative partnership will implement this plan. The Sustainable

Development Goals (SDGs) set in 2015 by the United Nations general assembly and intended to be achieved by the year 2030. The plan has 17 SDGs and 169 targets.

Today, progress is being made in many places, but, overall, action to meet the Goals is not yet advancing at the speed or scale required. 2020 needs to usher in a decade of ambitious action to deliver the Goals by 2030. More people around the world are living better lives compared to just a decade ago. More people have access to better healthcare, decent work, and education than ever before. But inequalities and climate change are threatening to undo the gains. At the core of the 2020-2030 decade is the need for action to tackle growing poverty, empower women and girls, and address the climate emergency (Figure 2.7).

Figure 2.7. United Nations sustainable development goals



Source: United Nations (n.d.-b).

SDGs goal No. 13 is related to climate – take urgent action to combat climate change and its impacts. Goal is linked to all 16 of the other goals of the 2030 Agenda for Sustainable Development. The UN has provided six climate-positive actions for governments to take (United Nations, n.d.-a):

- Invest in sustainable solutions: fossil fuel subsidies must end and polluters must pay for their pollution.
- Confront all climate risks.
- Cooperation – no country can succeed alone.

- Green transition: investments must accelerate the decarbonization of all economy sectors.
- Green jobs and sustainable and inclusive growth.
- Green economy: making societies and people more resilient.

Green economy refers to achieving economic growth while lowering pollution and greenhouse gas emissions, reducing waste, and increasing natural resource use. This will necessitate long-term investment and funding. While public funds are an essential source of green infrastructure funding, the transition to a green economy will also require large-scale private investment. In order to promote green development, governments must mobilize public and private finance and investments. Green finance and investment offers funding and investment in low-carbon, climate-resilient, and resource-efficient technology, infrastructure, and businesses. Green investments are investment activities that concentrate on businesses or initiatives that are dedicated to natural resource management, renewable energy development and exploration, clean air and water projects, or other environmentally friendly business practices. Those investments that derive all or most of their sales and income from green activities are known as pure green investments. Green investments may also be made in businesses with diverse business lines that concentrate on green programs or product lines. They are made in businesses and operations that produce goods and use manufacturing processes that are environmentally friendly. After the world became aware of global warming and its impact on the climate, green investing has grown in popularity (Chen, 2019). They can be made in a variety of areas, including renewable energy sources (wind, geothermal, and solar), organic farming or agriculture, waste management, and so on. Many of these areas have the aim of reversing the impact of global warming. There are numerous ways to make green investments using the various green investment vehicles available. Green shares, green mutual funds, and green exchange traded funds are all options for green investments (European Commission, 2019).

Countries around the world are facing climate related challenges and they might affect our societies, economies, environment for decades ahead. For that reasons, the implementation of green investments, a circular economy and sustainable bioeconomy can be seen as one of the most important mitigation and adaptation strategies for climate change.

It is important to create the carbon-neutral future in accordance with the Paris Agreement in order to implement a sustainable European bioeconomy. A sus-

tainable bioeconomy is also essential for the European energy sector to reduce emissions. Bioenergy, which is currently the EU's largest renewable energy source, is projected to remain a critical component of the energy mix in 2030, helping the EU reach its renewable energy goals of 20% in 2020 and at least 32% in 2030. Sustainable primary production on land and sea strengthens the bioeconomy's overall sustainability and provides "zero emissions", or carbon, in line with the Paris Agreement's commitments (European Commission, 2020).

Climate change mitigation and adaptation is this generation's global challenge. To achieve a greenhouse gas-free Europe, a sustainable and circular economy is necessary. Moreover, a sustainable bioeconomy has significant potential to minimize greenhouse gas emissions by encouraging more resource-efficient, productive, and sustainable primary production activities on land and sea, as well as improving ecosystems' ability to regulate climate.

Here are a few of the most important advantages of being a more sustainable company (Rogers, 2016):

- Improved brand image and competitive advantage. People are more likely to purchase a company's goods or services if they are aware of its effect on the environment and community.
- Enhance a company's ability to comply with regulations.
- Attract employees and investors. Employees and investors are willing to work with companies who are "doing the right thing" and are progressive with their environmental and social initiatives.
- Increase productivity and reduce costs.
- Reduce waste. Reduced carbon emissions and improved energy efficiency are two major advantages to being a green company.
- Make shareholders happy.

EU Green Deal for the European Union (EU) was adopted by European Commission (EC) in 2019. It demonstrates the European Commission's contribution to addressing climate and environmental issues. The Green Deal is an important part of the European Commission's plan for implementing the United Nations' 2030 Agenda and the Sustainable Development Goals (SDGs). It is a new development plan aimed at transforming the EU into a fair and prosperous society by 2050, with a modern, resource-efficient, and competitive economy free of greenhouse gas emissions and economic growth decoupled from resource use. It also aims to safeguard, preserve, and improve the EU's natural resources, as well

as citizens' health and well-being from environmental threats and impacts. Many sectors are covered by the European Green Deal, including economy, manufacturing, development, and consumption, large-scale infrastructure, transportation, food and agriculture, construction, taxation, and social benefits. The European Green Deal aims to raise the EU's greenhouse gas emission reduction goal for 2030 to at least 50% and possibly as high as 55% relative to 1990 levels. According to the Green Deal, the EC will amend environmental taxes and propose a carbon border reform. Energy efficiency will be prioritized, renewable energy sources can play a critical role in recent decades. Industry will act in a way of circular economy, bioeconomy, buildings construction and renovation will be organized in a way that is both energy and resource efficient, healthy and environmentally friendly food system will be designed, ecosystems and biodiversity will be restored, zero-pollution target will be set for a toxic-free world, green investments will be implemented. In order to achieve the target sets by the European Green Deal significant investments need.

According to the European Commission, meeting the existing 2030 environment and energy goals would necessitate an additional €260 billion in annual expenditure (about 1.5% of 2018 GDP) (European Commission, 2019).

Figure 2.8. The European Green Deal



Source: European Commission (2020).

As one of the instrument to achieve the targets of Green Deal is the new EU Circular Economy Action Plan approved by European Commission on 11th March 2020. It is the main part of the EU Green Deal (cf. Figure 2.8). The new action plan announces initiatives along the entire life cycle of products from their design to consumption ensuring that the resources used are kept in the EU economy as long as possible. The new Circular economy action presents measures to (European Commission, 2020, p. 33):

- Make sustainable products the norm in the EU.
- Empower consumers and public buyers.
- Focus on the sectors that use most resources and where the potential for circularity is high such as: electronics; batteries and vehicles; packaging; plastics; textiles; construction and buildings; food; water and nutrients.
- Ensure less waste.
- Make circularity work for people, regions and cities.
- Lead global efforts on circular economy.

In order to obtain climate neutrality, the following steps must be taken. Although lowering greenhouse gas emissions is essential, achieving climate neutrality would necessitate the removal of carbon from the atmosphere. Carbon removals may be natural, such as habitat regeneration, forest conservation, afforestation, sustainable forest management, and carbon farming sequestration, or circular, such as long-term storage in wood construction, re-use, and storage of carbon in goods like mineralization in building materials.

Meeting climate targets and achieving sustainable development goals are important for improving societal and economic resilience, increasing growth, reducing inequalities, ensuring safety and welfare of all ecosystems. Reaching the Paris Agreement's goals would necessitate rapid economic, social, and technological transitions into low-emissions, climate-resilient growth pathways that keep average global temperature rise below 2°C over pre-industrial levels. The majority of countries already have taken actions, but efforts for reducing greenhouse gas emissions are not sufficient yet.

“Strong climate action is not a threat to, but the foundation of, our future economic well-being” (OECD, n.d.). There are highlights six transformative areas and twenty key actions that are key to aligning financial flows with climate and development goals.

The six transformative areas are (OECD, n.d.):

- Plan sustainable and resilient infrastructure for a low emission and resilient future.
- Unleash innovation to accelerate the transition to low emissions technologies, business models and services.
- Ensure fiscal sustainability for a low-emission, resilient future.
- Reset the financial system in line with long-term climate risks and opportunities.
- Rethink development finance for climate.
- Empower city governments to build low-emission and resilient urban societies.

Climate change and new opportunities

While climate change cause big challenges at the same time it also represents some opportunities, for instance, to develop new markets and create jobs in climate friendly activities including, to encourage renewable fuels, carbon capture in agriculture, forestry, and energy and water conservation. Climate action will lead to the creation of industries that will help combat climate change while also lowering unemployment. Profits from sustainable resource use should be generated by small and medium-sized businesses. All can contribute to limiting global warming by taking climate-related measures in the areas of land use, ocean and coastal zones, water, human settlements, transportation, electricity, and industry. Humans just have to change habits and choose things and activities less harmful effects on the environment. People can perform ten simple acts each day (United Nations, n.d.-b): shower for 5 minutes, carry your own bag, switch off the lights, drive less, buy local produce, eat plant-based foods, recycle, refill, and reuse, unplug, and dress in zero-waste fashion.

Recently demand for natural resources (food, water, housing, infrastructure) is high and it continues to grow. Since 1970, resource extraction has increased by threefold. Materials, oils, and food production and processing account for half of overall global greenhouse gas emissions, as well as over 90% of biodiversity loss and water stress. If the world's population continues to increase at its current rate, nearly three planets will be required to provide the natural resources required to support our current lifestyles. The G20, a coalition of 20 major economies, is responsible for 78% of global greenhouse gas emissions.

Despite the fact that 790 million people in the world still lack access to energy, electricity powers our lives from machine to refrigerator. The planet would save US\$ 120 billion per year if we turned to energy-efficient light bulbs. The energy supply sector (electricity, heat, etc.) is the leading source of global greenhouse gas emissions, accounting for roughly 35% of total emissions. Households consume 29% of global energy and produce 21% of CO₂ emissions as a result. We can save energy and resources by unplugging our devices and appliances when they are not in use. Switching to renewable energy sources, also means less pollution (Figure 2.9).

Figure 2.9. Environmentally friendly actions for every one



Source: United Nations (2020).

Since 1970, transportation-related greenhouse gas emissions have more than doubled, with road vehicles accounting for roughly 80% of the rise. Currently, the transportation industry accounts for about a fifth of all energy-related CO₂ emissions. Air pollution and greenhouse gas emissions can be reduced by walking, biking, and using public transportation. Switching to electric vehicles by 2050 could save over 60 billion tons of CO₂.

Water is a basic and the most important natural resource. Unfortunately, less than 3% of the world's water is unfit for human use, with 2.5% frozen in Antarctica, the Arctic, and glaciers. People can save water by taking shorter baths, turning off the faucet while brushing their teeth, and a variety of other methods. Agriculture is one of the major water consumers, accounting for 69% of total annual water use.

One-third of all food produced is wasted, ruined, or destroyed. These figures indicate a significant waste of resources such as land, water, electricity, and other inputs, as well as the output of excessive greenhouse gases. To feed the world's rising population, the world will need to generate around 50% more food by 2050.

The apparel industry accounts for more than 8% of global greenhouse gas emissions and 20% of global wastewater. Buying less clothing and shopping at thrift stores, recycling helps to save water and reduce waste. 85% of textiles materials could be reused. Every year, around 11.2 billion tons of waste are collected globally, accounting for around 5% of global greenhouse gas emissions.

If the targets of Paris agreement are to be achieved, it will take efforts for economic, social, technologic and individual transformations into low-emissions and climate-resilient development pathways.

KEY TERMS

- Climate change – the global warming driven by human emissions of greenhouse gases and the resulting in large-scale weather shifts.
- Climate risks – consequences for humans and social-ecological systems resulting from the climate-related hazards.
- Climate mitigation – reducing emissions and stabilizing the levels of greenhouse gases in the atmosphere.
- Climate adaptation – adapting life in a changing climate (involves adjusting to actual or expected future climate).
- Green investments – investment activities that focus on companies or projects committed to the conservation of natural resources, the production and discovery of alternative energy sources, the implementation of clean air and water projects, or other environmentally conscious business practices.
- Bioeconomy – the production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed, bio-based products and bioenergy.
- Circular economy – is an economic system aimed at eliminating waste and the continual use of resources.

SUBCHAPTER SUMMARY

Climate change is becoming a growing problem, the effects of which are being observed all over the world. The world is warming faster than ever. For global temperatures to fall by 2°C, it is simply necessary to transform the systems of industry, energy, food, transport and many other areas around the world. The world has taken a major step forward in terms of climate change with the adoption of the Paris Agreement in 2015, when all states committed to take measures addressing climate change. Many companies are also committing themselves to reduce greenhouse gas emissions as it makes economic and business sense and it makes companies sustainable as well.

Global warming is already having an impact that is extreme on climate, nature and the weather. It is therefore particularly important to continue climate-related actions for adapting and mitigating such as decarbonization of all economy sectors, use of renewable energy, ensuring efficiency of energy, providing eco living, making green investments, etc., not only today, but also in the future. In general, climate-related risks (for instance, the collapse of some ecosystems, economic impacts) may have long-term or non-irreversible effects.

No other species, except homo sapiens, produce waste that does not get recycled in some way. The only way for reducing our ecological footprint and for ensuring mitigation of climate change is to modify our lifestyle, to change our mindset, to produce goods and run all the economic, social, technological activities in such a way that any waste material gets used more effectively.

DISCUSSION QUESTIONS

1. Climate related risks. Are there other risks related to climate change?
2. What are the most important international agreements on climate change and results of their implementation?
3. What are the measures of climate change mitigation? Which of them are most effective?
4. Give practical advice on climate change mitigation.

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2.1.2. Energy production and consumption

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LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- understand the nature of and issues related to different energy sources,
- distinguish different uses of energy and its consumption patterns,
- analyze statistics referring to electricity and energy,
- follow trends in the use of energy resources, regional differences and their causes,
- analyze demand and supply of energy and their formative factors,
- acknowledge the issues of energy transition and the system of smart grids,
- recognize the role of R&D in creating innovative solutions to address the most urgent energy issues.

Introduction

The rate of economic and social development has led to significant increase in demand on energy whose production based on fossil fuels caused serious devastation of the natural environment. Consequently, societies faced the threat of

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running out of fossil fuels which encouraged actions towards finding alternative solutions. Affordable and clean energy is the 7th sustainable development goal as defined by the UN, but other goals, such as the 13th one which calls for climate action or the 12th one focusing on responsible production and consumption are also linked to sustainable energy. The EU authorities and institutions make a lot of effort to enhance activities towards transition to carbon neutral sources, improving energy efficiency and limiting harmful effects of energy production. The abundance of renewable resources, absence of geographical barriers and concentration typical of fossil fuels provides for egalitarianism and equalizes the chances of countries and regions regarding energy generation.

Access to energy sources has been one of the core factors that contribute to the countries' economic growth and well-being of their societies. Increasing demand on energy is interdependent with economic and social welfare, so that energy fuels the development while prosperity and technological progress, in turn, call for more energy. As a result, fossil fuels whose intensified extraction and use have led to serious environmental damage have to be replaced by alternative sources, such as nuclear energy and renewable resources.

Energy security strategic to countries development should be a central element of the national and regional policies. If the distribution of energy resources is uneven, the regions with deficit are vulnerable. The development of economy, being derivative of access to energy, demands its availability and security. Also increasing consumption should be paired with access to energy supplies, support of energy self-generation and integration within smart grids. Issues on the way to unavoidable energy transition need to be tackled consistently and comprehensively to ensure energy sustainability.

Energy sources. Characteristics and issues of resource utilization

In contemporary economy energy sources fall within three main categories:

- fossil fuels
- nuclear energy
- renewables.

Fossil fuels, whose common feature is their formation from fossilized, buried remains of plants and organisms that lived millions of years ago resulting in high

content of carbon, include coal, crude oil, and gas. Coal is the richest in carbon content which amounts to 223 pounds of carbon dioxide per million British thermal units. Oil and natural gas have less – 163 and 117 pounds of carbon dioxide respectively (Statista, 2021).

Coal is a solid rock and has four main varieties differentiated by carbon content: lignite, sub-bituminous, bituminous, anthracite. It can be extracted by underground mining when it is cut from underground deposits by heavy machinery or surface mining (aka strip mining) as layers of soil and rock get removed to access deposits. Crude oil is liquid and contains mainly hydrocarbons (hydrogen and carbon compounds). It is found in the cracks, crevices and pores of rock in underground reservoirs as well as in tar sands (near the surface) and shale. It is extracted by drilling or strip mining and after that transported to refineries to be processed and transformed into useable fuels. Natural gas is composed mainly of methane and located in porous and permeable rock, shale or mixed into reservoirs. Extracting oil and gas involves drilling and in case the reservoirs are difficult to access, fracking is necessary to recover trapped deposits from underground rock formation (Britannica, n.d.).

Fossil fuels are known to cause a myriad of harmful effects which are activated either by extracting methods or in the process of generating energy by burning. Excavation can directly lead to unearthing, while processing or moving of deposits contribute to landscape and ecosystem degradation. Infrastructure, such as wells, pipelines, roads, is needed in order to carry out the operations and on their completion a lot of waste remains. Wildlife habitat is destroyed as the processes are carried out. Waterways and groundwater are often severely affected when after mining operations washing acid drips into streams, rivers and lakes or unwanted rock and soil is dumped.

Similarly, oil spills and leaks may pollute water sources, waters of seas and oceans, or, in the worst scenario, contaminate drinking water. Active oil and gas wells and processing facilities cause a lot of pollution after transmission of chemicals such as benzene and formaldehyde into the atmosphere. They have been found to cause leukemia, blood disorder and cancer. To make things worse, airborne particulate matter causes severe lung and respiration organs' disorders, in particular for the miners. Therefore, oil extraction and processing have been going through extraordinary change to eliminate the side effects.

Out of all fossil fuels, gas is considered to be the cleanest while burning and there are efforts to intensify its utilization while limiting other fossil fuels.

In effect of burning fossil fuels large quantities of carbon dioxide are generated. These, in turn, trap heat in the atmosphere. Mercury, sulphur dioxide (contributing to acid rain), soot are emitted to the air. The resulting process of global warming drives climate change which can have far-reaching negative effects and, as such, the process has been given priority by policymakers.

In addition, fossil fuels when used to power vehicles produce harmful carbon monoxide, nitrogen oxide and cause smog. These also contribute to ocean acidification as water absorbs about a quarter of carbon emission. Increased water acidity results in decreasing amount of calcium carbonate which is the substance needed by water organisms to form shells. Deprived of the components of the building matter, the underwater creatures do not grow at a regular desirable pace and their shells are weakened. Therefore food chains and coastal areas activity, such as oyster industry, are jeopardized.

This cycle and interrelated processes contribute to natural environment destruction in a broad sense and give rise to movements towards accelerating transition from the most harmful to more environment friendly sources – those carbon neutral. The process, however, is slow and difficult.

One of the alternative energy sources is nuclear (atomic) energy that can be generated in processes affecting nucleus (core) of atom. Uranium is the element needed to produce energy explosively by controlled nuclear fission in reactors (or fusion) (Britannica, n.d.). Certain countries, including Poland, intend to still extend energy generated from this process, in particular in areas where uranium is available. The advantages of this type of energy include low emission of pollutants, low fuel consumption, high reliability and long life of power plants and high concentration of power. The most serious drawbacks are relative to security measures, their cost to prevent the potential risk of radiation, resulting resistance of local society as well as storage of radioactive waste (Marks-Bielska, Bielski, Pik, & Kurowska, 2020).

Renewable energy sources are the centre and ultimate target of global energy transition. By and large they derive from the Sun, Moon, and Earth and the degree to which they can be exploited is relative to geographical location, local topography, the extent of woodland and farmland, bodies of water, climate, atmospheric parameters such as dust, temperature, pollution, humidity, air mass. They include solar (thermal, photovoltaic and concentrated) energy, wind, hydropower, rain, tides (waves), and geothermal energy as well as biofuels/biomass, ambient heat captured by heat pumps, and the renewable part of waste (Eurostat, 2020). Table 2.1 contains a list of renewable resources together with

infrastructure and devices needed to convert them into useful energy components.

Table 2.1. Renewable resources infrastructure and use

Source	Infrastructure/devices	Use
solar	ocean thermal energy plants	electricity
	heat pumps	thermal energy
	collectors and thermal solar plants	thermal energy
	PV cells and solar power plants	electricity
	photolysis	fuel
water	water power plants (evaporation, melting of ice/ snow, precipitation)	electricity
wind	wind farms	thermal energy electricity
waves	wave power plants	electricity
ocean currents	ocean current energy plants	electricity
tidal/gravity	tidal power plants	electricity
geothermal	heating and geothermal power plants	thermal energy electricity
biomass	heating and thermal power plants	thermal energy electricity
	conversion devices	fuels

Source: Based on: Marks-Bielska et al. (2020).

Solar radiation is considered as a basic renewable resource which can serve to generate thermal energy and electricity. While it is widely available, its amount, intensity and extent are diverse across the world. Its efficiency depends on the number and efficiency of the devices, state of the air, and the helioenergetic conditions. Cells are the units of a solar panel and their number determines its capacity. Solar collectors have many industrial uses including processing of other resources, such as biomass, biogas and oil, and photovoltaic panels have been increasingly used by households.

Hydropower stations use water flows and level difference from rivers as well as tides, waves and currents. They use cascading and reservoirs or diversion stations without reservoirs and pump storage stations.

Geothermal energy is carried by water and/or steam to the Earth's surface and derived within the sub-surface, usually located close to tectonically active regions (IRENA, n.d.). It is mainly utilized for heating or cooling (heat pumps), in agriculture, food processing and tourism.

Biomass defined in the Act of 7 June 2018 (passed by the Polish Sejm) Amending the Act on Renewable Energy Sources and Some Other Acts consists of “biodegradable parts of products, waste, and biological remains of agriculture, including vegetable and animal substances, forestry, and related industries, including fishery and aquaculture, as well as processed biomass, in particular in the form of pellets, briquette, biochar, and biocoal, and biodegradable parts of industrial waste or communal waste of vegetable or animal origin, including waste from recycling installations and waste from water and sewage treatment, in particular sewage sludge, in accordance with provisions on waste related to the -qualification of energy recycled from thermal waste processing.” (Ustawa z dnia 7 czerwca 2018 r. o zmianie Ustawy o odnawialnych źródłach energii oraz niektórych innych ustaw). Thus, the definition embraces its solid forms (wood and biogenic materials, eg solid waste), liquid (e.g., bio-oil) and (bio) gas.

Solid biomass consists of organic substances (e.g. wood, sawdust) which are used in the energy industry as fuel to produce electricity and thermal energy.

Liquid biofuel is produced from plants, i.e., grains, potatoes, beetroots, etc., and used in transport, production of electricity and thermal energy.

Biogas is obtained in the process of biomass fermentation, therefore its type depends on the composition of the ingredients used. It is flammable and includes methanol and carbon dioxide. The most frequently used waste for producing biogas comes from vegetable and animal waste, landfills, sewage sludge, breweries, slaughterhouses, and other food-processing plants (Marks-Bielska et al., 2020).

Waste is the option of energy production with huge potential. Known as waste-to-energy (WtE) or energy-from-waste (EfW), the process can lead to generating energy from waste in two forms: electricity or heat (waste treatment) or fuel by processing waste. The former involves direct combustion/incineration of waste, while during the latter process, combustible fuel, such as methane, methanol, ethanol, synthetic fuels (liquid or gaseous fuel obtained from syngas – a mixture of carbon monoxide and hydrogen) are produced. While incineration may reduce landfill, it simultaneously leads to disincentivized and hence limited recycling. This may be particularly critical when disposing of plastic.

The side effect of direct combustion is environmental pollution and different methods are being developed to avoid it, including thermal and non-thermal technologies. Also, higher temperature of combustion of refined converted fluids, which is possible thanks to separation of corrosive components, can make the process less harmful.

The European Commission imposes strict limits and regulations on combustion to restrict emission of nitrogen oxides (NO_x), sulphur dioxide (SO₂), heavy metals and dioxins (European Commission, 2000). Therefore the solutions (and energy mixes) have to be aligned with the requirements and member countries have to consider a wide spectrum of issues.

While all sources of renewable energy have advantages, including most importantly availability, permanent character and eco-friendliness, their conversion into energy can have certain consequences, side effects and require costly infrastructure. Advantages and factors that can potentially be considered as obstacles to wide use of renewables are presented in Table 2.2.

Table 2.2. Pros and cons of renewable energy sources

Source	Advantages	Disadvantages/obstacles
hydropower	low cost of energy generation, automation of electricity production, constant access	natural environment, silting of riverbeds, alteration of landscape, facilities that can produce hazardous substances, e.g. ethane, high cost of construction and level of noise
waves	potential	not economical, impossible to predict the amount generated
wind	available everywhere	availability depending on topography (plain and coastal areas more effective) off-shore wind farms (50% more expensive, better parameters/ predictability)
solar radiation	accessible, environment friendly	storage, cost of installation, area for installation, seasonality, dependence on air cleanliness, helioenergetic conditions
biomass	the least capital intense, economic activation of rural communities, additional jobs, use of food, waste, developing wastelands	risk of decreasing biodiversity of crops, pollution from combustion, toxic emission from pesticide-contaminated biomass combustion, seasonality
geothermal	local character of resources, particularly abundant in seismic areas, independence of weather, no impact on environment	risk of water and atmosphere contamination, accessibility

Source: Based on: Marks-Bielska et al. (2020).

IRENA (2019) estimates that by 2025 the global weighted average cost of electricity could fall by 26% from onshore wind, by 35% from offshore wind, by at least 37% from concentrated solar power (CSP) technologies, and by 59% from solar photovoltaics.

While renewable energy is the cheapest and the most eco-friendly option, an important challenge remains – its intermittence and consequently storage as well as transport. Therefore, scientists have been working on ideas to trap energy. One of such developments is the fluid which can work as a rechargeable battery (harvested solar energy is used to recharge it), called “solar thermal fuel”. The liquid was developed by researchers in Chalmers University of Technology in Sweden in 2018 and reportedly it can store energy captured from the Sun for a month at room temperature and afterwards release the thermochemical energy. The solar thermal collector named MOST (Molecular Solar Thermal Energy Storage System) works in a circular manner. A pump cycles the solar thermal fuel through transparent tubes. When sunlight makes contact with the fuel, the bonds between its atoms are rearranged and it transforms into an energy-rich isomer. The Sun’s energy is then captured and stored between the isomers’ strong chemical bonds. “Combining the chemical energy storage with water heating solar panels enables a conversion of more than 80% of the incoming sunlight” (Chalmers, 2017).

The energy stays trapped there even when the molecule cools down to room temperature. The heat can be triggered on demand. To put the trapped energy to use, the liquid flows through a catalyst (also developed by the research team) creating a reaction that warms the liquid by 113°F (63°C). This returns the molecule to its original form, releasing energy in the form of heat. “Energy suppliers can use the MOST system for capturing and storing solar energy for up to 18 years and transport it without any major losses” (Innovationnewsnetwork, 2020).

When an energy demand occurs, the energy-rich fluid can be used to power household appliances, a building’s water heater, etc., or for industrial applications, including low-temperature heat used for cooking, sterilization, bleaching, and distillation.

Advances in the development of MOST involve the technology applied in a window film to even out the temperature indoors on hot days. The molecule has been incorporated in blinds and windows through a spin-off company Solartes AB. Researchers believe the technology could be in commercial use (Solartes, n.d.).

Importantly, transfer of energy is possible and geographic barriers to energy generation can be overcome after such developments become widely available.

An important element in energy transition is hydrogen whose role is to overcome the challenges of energy distribution. It is a versatile energy carrier, which

can deliver or store huge amounts of energy when used in fuel cells to generate electricity, power and heat. Hydrogen can be produced from fossil fuels or renewable resources. Its role is focused on mitigating imbalances between power supply and demand, playing a role of buffer, and supporting areas of energy use difficult to electrify via grids or batteries, e.g., energy- intensive industry, long range transport, aviation, where electrification is not convenient or costly.

Access to energy and energy consumption

There is no uniform definition of “access to energy”, but most of them refer to delivery of electricity, safe cooking/heating facility (fuels and stoves) as well as minimum level of consumption. According to the International Energy Agency access to energy is equivalent to “a household having reliable and affordable access to both clean cooking facilities and to electricity, which is enough to supply a basic bundle of energy services initially, and then an increasing level of electricity over time to reach the regional average” (IEA, 2020b). However, the definition does not cover an important factor of electricity access of businesses/ economic activity, e.g., the power needed for agriculture, textile industry, etc., or street lighting and public buildings, such as schools and hospitals.

Interestingly, delivery of energy to households does not always mean they use it. Moreover, energy application also depends on an ability to meet minimum level of electricity diversified across rural and urban areas. Rural households are required to go beyond the threshold of 250 kilowatt-hours (kWh) per year while for urban households it is double that amount (500 kWh per year). The volumes are dynamic, however, and likely to increase in time (Ritchie & Roser, 2020).

A list of prioritized Sustainable Development Goals includes access to energy which enables progress in meeting other goals, such as, inter alia, poverty reduction, economic growth and raising standard of living. The target established as 100% access to energy to be reached by 2030 might be, however, difficult to meet.

While access to energy is growing constantly – from 71% of global population in 1990 to 87% in 2016, there are certain regions which lag behind the average. As a result, 13% of the world (940 million people) did not have access to electricity in 2016. The share of people who have access to and also use electricity is an important indicator of social as well as economic sustainability. For countries defined as developed, 100% electrification of households is considered as a pre-

requisite of sustainability. It should, therefore, be assumed that low and middle-income countries have yet potential in driving the development of electrification. In India the growth has been significant: from 43% in 1990 to 85% in 2016 and in Indonesia from 62% to 98% in the same period. Considering high population growth in the countries, such numbers translate into even more significant increases. Simultaneously, countries at the other end of the spectrum, such as Chad at 8.8% of its population with access to electricity have yet to go a long way towards narrowing down the gap between the rest of the world (Ritchie & Roser, 2020).

The total energy is produced to be consumed by the following three components:

- electricity,
- transport,
- heating.

Although the two terms: **energy and electricity** are often used interchangeably, in fact they are **not synonymous**. Electricity (aka power) is a narrow term which constitutes only one component of total energy consumption. The primary energy sources are used for generating power, providing fuel for transportation, heating and cooling residential and industrial buildings. Interestingly, in the EU residential buildings are responsible for one quarter of overall energy consumption.

While total demand on energy and its consumption increase constantly, they are derivative of household and industry use and relative to the vibrancy of economic activity. Increase in consumption is parallel to economic growth and is significant in countries with the highest pace of growth. In general, crises or disturbances inhibit growth and it is slower than in times of prosperity. "Global energy consumption growth slowed down in 2019 (+0.6%) compared to an average +2%/ year over the 2000-2018 period, in a context of slower economic growth" (Enerdata, 2020).

As a result of COVID-19 crises, lock down and restrictions that followed, demand on energy and its consumption decreased. In addition, limited production and transport, as consequences of both lower demand on goods and restrictions imposed on travelling for business and pleasure had negative impact on energy demanded.

This trend was mirrored in global CO₂ emissions estimated to have declined by 8% in 2020 (almost 2.6 gigatonnes), to levels of 10 years ago. "Such a year-on-year reduction would be the largest ever, six times larger than the previous record

reduction of 0.4 Gt in 2009 – caused by the global financial crisis – and twice as large as the combined total of all previous reductions since the end of World War II.” (IEA, 2020a).

There are also other factors that affect demand on energy and consequently environmental pollution. While electricity production, transport, extractive industries, agriculture and manufacturing together produce close to 90% of all CO₂ emissions by business sectors, they account for less than 25% of employment and gross value added in the EU. Low carbon industries and service sectors produce less than 10% of all CO₂ emissions but employ more than 70% of the EU workforce. Further development of service industries is likely to fuel demand on human resources as well as electricity. Energy consumption for transport needs has important impact on environmental sustainability and long commutes to workplace create negative environmental spill-overs. This way the place and structure of employment are interrelated with amount of energy needed and pollution.

Energy security

The notion of energy security is a core component of national security and refers to an ability of a nation and the economy to have unrestricted access to energy. The role of each state and its institutions should be to create legal framework, use market tools and incentives to ensure current and future demand of private and business recipients on energy is met. Thus, each country should ensure its potential to provide for sufficient amount of energy demanded is achieved so as contemporary and future needs are met at an affordable price. ”The definition of energy security is dynamic and contextual. The scope of energy security has been extended to place emphasis on dimensions such as environmental sustainability and energy efficiency” (Ang, Choon, & Ng, 2015).

The Commission of the European Communities in 2000 elaborated on the issue of energy security defining it as “the uninterrupted physical availability of energy products on the market, at a price that is affordable for all (private and industrial) consumers, while respecting environmental concerns and looking towards sustainable development” (Commission of the European Communities, 2000).

Energy security gained particular attention with an advent of oil crises (oil price shock) of the 1970s in Europe, Japan and the US. The International Energy Agency (IEA) was established in 1974 by the countries of the Organization for

Economic Co-operation and Development (OECD) with an objective to promote energy security among member countries. One of the remedies was holding stocks equivalent to at least 90 days of net oil imports to prevent physical disruptions to supply (Paravantis, Kontoulis, Ballis, Dourmas, & Tsirigotis, 2018).

Increasing energy consumption and its negative impact on natural environment and global warming intensified efforts towards energy transition and security. Within the EU focus has been on the three aspects: security of resources, uniform energy market and environment protection. Energy security is, therefore, a much broader category encompassing sustainability, resources availability, security of supply to meet demand, reliability of suppliers, safe technology of exploitation and/or harvest as well as dealing with waste.

Diversification of energy sources and technology is a prerequisite of energy security and a way of improving cost efficiency. Thus, energy security refers to different dimensions: more resources for energy production provide for minimizing risk of depletion of sources, independence of imports as well as various political and economic conflicts and resulting disruptions. While energy security has been gaining importance since the 80s, the crises of the first decade of the XXI century and disruptions in supplying resources it involved clearly showed the urgency of addressing energy related problems in different parts of the world. Additionally, political conflicts, commercial and price disputes in Russian Federation which resulted in supply cuts in 2009 demonstrated EU's vulnerability and dependence on the situation in the region.

The EU energy security is reliant on natural gas which accounts for about 25% of all energy consumed in the EU. Its imports cover 58% of the supply needed. Oil, as the second strategic resource for the EU, is also imported. In 2008, 1/5 of oil consumption of the EU was covered by resources from Russia, 42% of the gas imports come from Russia, and around 80% of EU imports of gas from Russia pass via Ukraine. All in all, 53% of the EU energy resources were imported from the Russian Federation. (Commission of the European Communities, 2009).

Political issues between Russia and Ukraine (gas crises), price disputes between Russia and Ukraine and a trade dispute between Gazprom and the Ukrainian company Naftogaz (in 2009) affected the EU when supply was limited (Le Coq & Paltseva, 2012).

The EU Member States, deprived of 20% of their gas supplies (30% of imports), were affected either directly or indirectly, including Poland, Slovakia, Hungary, and above all Bulgaria and Romania. The scope of the problem is illustrated by

the percentage of dependence on Russian imports which then amounted to 77% among the eight new Eastern European Member States. “The EU was not the only victim of the crisis. Other non-EU countries in south-east Europe suffered significant disruptions to their energy supply, with the international community stepping in to supply emergency fuel aid to Moldova“ (Commission of the European Communities, 2009). Though the crises was over after Gazprom and Naftogaz signed new 10-year agreements on the purchase of gas by Ukraine and the transit of gas to the EU via Ukraine in January 2009, it showed gaps in the energy security system and vulnerability of the EU in this respect.

Another gas conflict between Russia and Ukraine in 2014 was parallel to the Ukrainian civil war and the annexation of Crimea by Russia. The price dispute that followed brought about new cuts in gas supply to Ukraine, which challenged the EU energy security and demonstrated potential pressure that could be inserted by Russian Federation on the EU through energy tool.

It should be concluded, therefore, that geopolitical factors are important indicators for decision makers of directions to energy mixes and resources to ensure energy generation and/or its constant availability.

Energy mixes – shifts over time and regional characteristics

The term “energy mix” refers to the combination of the various primary energy sources used to meet energy needs in a given geographic region and embraces fossil fuels, nuclear energy and numerous sources of renewable energy. In the past the sources were much limited which resulted in mostly homogenous energy mixes across countries and territories. At present, with the wide scope and constantly developing technologies to utilize renewable resources, each country uses the sources of energy available in differing proportions. The composition of the energy mix varies greatly not only between countries, but also regions. Moreover, it is a dynamic category, changing in time. While cross-country analyses show significant differences between countries, fossil fuels dominate the energy mix at the global level, accounting for over 80% of the total energy sources (85% in 2018).

Among the factors that influence and shape the mixes are:

- the availability of different resources and the possibility of importing them,
- the extent and type of energy needs,

- environmental and geopolitical factors and policy determined by historical, economic, social, demographic variables (Planete Energies, 2015-2021)

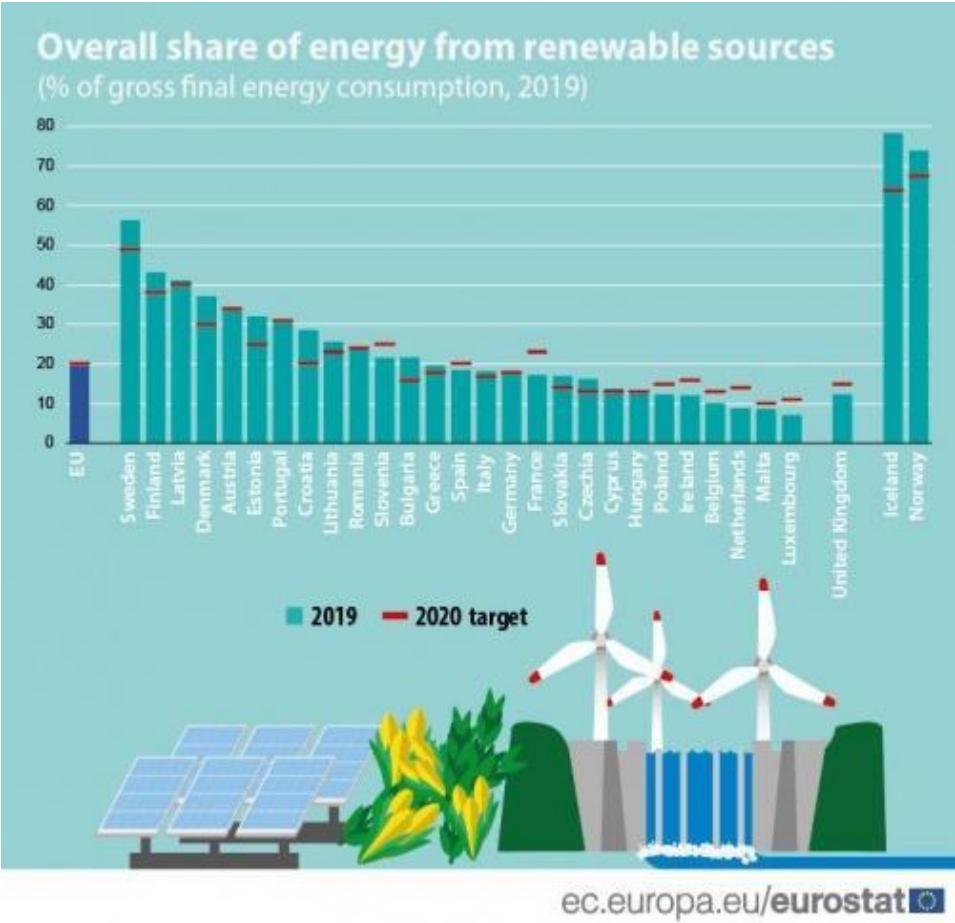
Energy generation depends on natural resources availability, including renewables, such as wind and sunshine. The share of fossil fuels in energy production depends on market factors, in particular price.

The level of economic development as well as its pace affect the way energy is supplied and the sources used to generate it. It can be observed, for instance, that for dynamically developing economies, the growing demand on energy cannot be matched by equally dynamic transition to renewable resources. This is the case in China and India, where the share of fossil fuels in energy production remains high (coal represents almost 60% of the energy mix). Abundant resources of coal and its relatively low price result in low share of renewable sources such as solar and wind power in energy production. However, in the United States where coal and oil were used extensively, the trend has reversed due to the boom in shale gas and renewable energy so as a third of its mines have been closed since the start of the XXI century.

Moreover, the category of energy mixes is dynamic and different circumstances may affect its changing structure. It was the case of the COVID-19 pandemic in the EU, where the fall in demand and higher renewable production has driven down the use of non-renewable resource from February until early in July 2020, while weekly renewable production was higher than generated by fossil fuel. In the second half of the year the trend reversed because of lower wind production. In contrast, natural gas generation increased in the power mix as a result of low gas prices and higher carbon prices (IEA, 2021).

Figure 2.10 illustrates the share of energy from renewable sources across the EU. In 2019, renewable energy represented 19.7 % of energy consumed in the EU-27 (which was only 0.3 % short of the 2020 target of 20 %), while the share of energy from renewable sources used in transport activities in the EU-27 was much lower at 8.9 % (Eurostat, 2020).

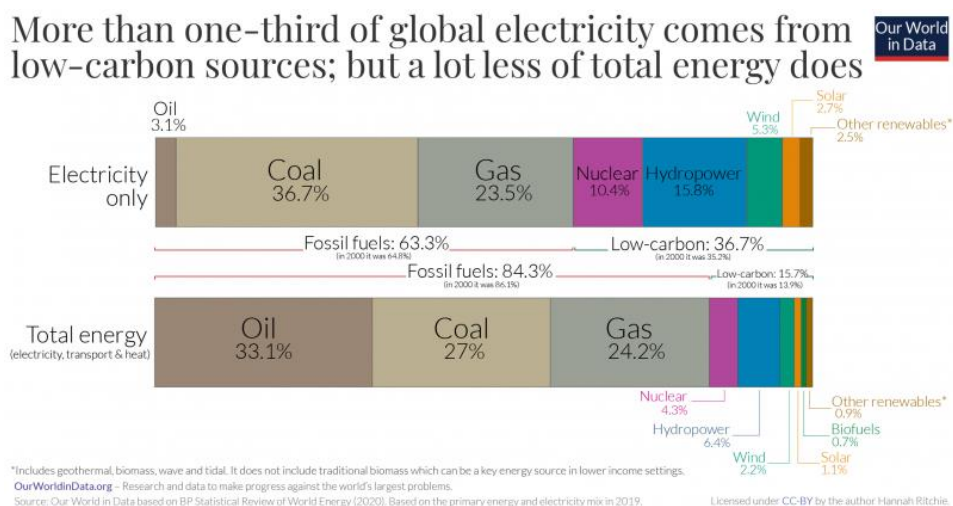
Figure 2.10. Share of energy from renewable resources in the EU countries in 2019



Source: Eurostat (2020)

All in all, in 2019, 33.1% energy was generated from oil, 27% from coal, and 24.2% from gas (Figure 2.11).

Figure 2.11. Share of electricity and energy sources in the world in 2019



Source: Ritchie & Roser (n.d.).

In order to provide for more specific vision of the potential utilization of renewables in energy sector, it is useful to distinguish electricity as its component.

While one-third (36.7%) of global electricity comes from low-carbon sources, only 15.7% of total energy is generated from low-carbon sources, such as renewables and nuclear energy.

Interestingly, the percentage of electricity produced from low-carbon sources remains nearly unchanged: in 1985 it accounted for 35.9% while in 2020 for 39.11%.

For example, Paraguay and Nepal only use low-carbon sources and Iceland, and Congo get nearly all electricity from renewable sources (99.99). This is possible thanks to availability of hydropower and/or nuclear sources. A lot of EU countries get over 90% of their electricity from low-carbon sources, e.g., Sweden, Norway, France. At the other end of the spectrum are the following countries: Belarus generating only 2.89% of electricity this way, followed by Ukraine with 9.98%, Czech Republic with 12.09%, Hungary with 14.65% and Poland with 16.91% of electricity produced from low-carbon sources in 2020 (Ritchie & Roser, n.d.).

An important indicator of carbon intensity of electricity generation is the amount of CO₂ produced per unit of electricity (grams of CO₂ produced per kilowatt-hour-kWh). Most European countries are in the middle of the league, e.g., Italy

at 212, Croatia at 164, Slovenia at 219, and Spain at 190. Poland is at the top of the ranking with 724 grams CO₂ per kilowatt-hour, with Estonia (669), Greece (522), the Netherlands (318), Czech Republic (386), Bulgaria (352) and Germany (301) following behind. The lowest emission is generated by Sweden (13), France (55), Austria (83), Slovakia (90), Latvia (92) and Finland (67).

In Poland most of electricity is from coal (69.83%) and similarly high percentage of coal is used by Serbia (69.99%), Bosnia and Herzegovina (67.7%). Belarus gets most of its electricity from gas (97.11%) and the Netherlands use 59.82% of gas to produce its electricity. Nuclear energy predominates in France (67.2%), Ukraine (52.34%), Finland (34.43) and Sweden (30.18) (Ritchie & Roser, n.d.).

Energy supply

The unit of energy – the tonne of oil equivalent (toe) – is used to measure the amount of energy supply. It is defined as the amount of energy released by burning one tonne of crude oil, approximately equal to 11.630 megawatt-hours (MWh), though, as crude oil may have different calorific values, the definition and value are rather conventional.

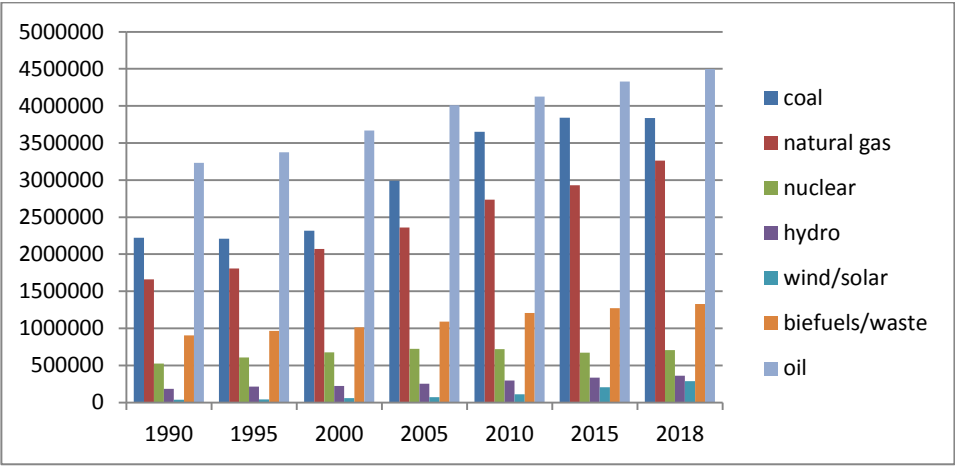
Figures 2.12 and 2.13 illustrate total energy supply (TES) in the world and EU-28, respectively.

The data worldwide indicate an upward trend in consumption of all energy sources. Oil and coal not only predominate in energy generation, but also continue increasing. Significant growth has been also noted in natural gas consumption (Figure 2.12).

Within the EU a downward trend in the use of oil and coal has been observed since 2005 and 1995, respectively (Figure 2.13). This is due to the policy aimed at reducing reliance of the Member States on fossil fuels and strict regulations on emissions and air pollution. As illustrated in the chart, although the processes of transition are complex and difficult for technological, economic and social reasons, the policy has been effective.

The supply of energy generated from gas reflected fluctuations resulting from the conflict between Russia and Ukraine in 2014.

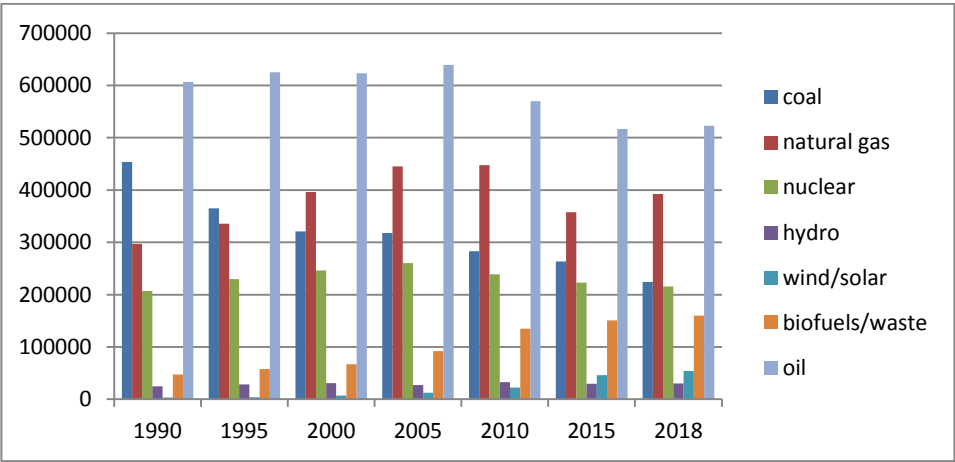
Figure 2.12. Total energy supply (TES) in the world by source
(in kilotonnes of oil equivalent – ktoe)



Source: IEA (2020c).

The most significant increase (from 47.5 to 160 K ktoe) has marked the use of biofuels and waste in energy production, though their share in total energy generation has not greatly changed. Although the participation of wind and solar energy in 2018 was still not remarkable, it increased fourfold between 2005 and 2018 (from nearly 13 to more than 54 K ktoe).

Figure 2.13. Total energy supply (TES) by source - European Union – 28
(in kilotonnes of oil equivalent – ktoe)



Source: IEA (2020c).

As the new technologies are constantly being developed and perfected, advanced devices, such as photovoltaic panels, wind turbines are more productive, improved efficiency of renewable resources will be possible in the future and is likely to lead to their increased share in energy generation.

Smart grids

Smart grid is an electricity network based on communication between all its members to integrate all dispersed energy sources/producers while enabling efficiency, and cost reduction.

The system of energy grids requires that devices and technologies are developed which will simultaneously enhance the necessary transitions. Decarbonization, decentralization, and digitalization are indispensable elements of the system development.

Variable sources of renewable energy should be integrated resulting in improved capacity of the system.

Modernized electricity networks enable participation in the system by self- energy generation and storage, as well as improve distribution and transmission to the end user. They will provide for flexibility of demand and response and balancing generation and demand. The process involves integration of power from renewable sources (increasingly decentral) with multidirectional energy flows.

Lower cost of electrification of heating, cooling and industry uses should be an incentive accelerating the process. “Deploying a physical layer of smart-grid infrastructure – underpinned by smart meters – can help unlock the benefits” (Shabanzadeh & Moghaddam, 2013).

The challenges involve: grid stability, power quality, sector coupling, aging assets, and costs of their replacement.

Energy **intelligence** brought to the grid creates new opportunities, in particular in the area of cybersecurity and asset security.

According to the data revealed by the International Energy Agency (IEA, 2020c), investment in smart grids continues with reference to digitalization and decentralization despite a downward trend in overall expenditures which originated in 2017 and in 2019 represented a drop of 7% year-on-year. Investment involves the following technology areas: power equipment, smart meters, smart

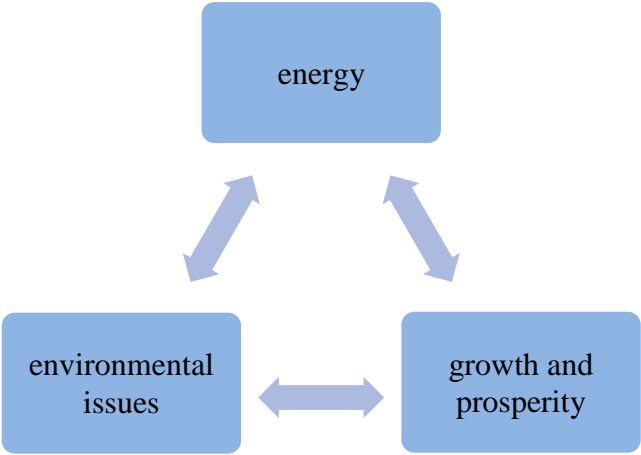
grid infrastructure and EV chargers. The share from digital grid infrastructure increased from 10% in 2014 to 17% in 2019 and reflected an upward trend throughout the period of time (IEA, 2020d).

All in all, investment across the world targeted utilities which were developed by application of sophisticated technologies, including artificial intelligence and digital twinning. In the European Union the Clean Energy Package was launched, with focus on measures to help grid operators deploy smarter technology (IEA, 2020d).

Energy transition dilemma

A widespread belief has it that energy production and consumption are intrinsically connected with economic growth which is translated into prosperity. As households can afford to buy more appliances and/or replace old ones with new ones more frequently, their increased demand leads to intensified production and environmental pollution. In addition, they have to dispose of the unwanted things thus contributing to waste generation. Increasing environmental issues should, in turn, generate concerns and lead to designing precautionary measures to halt them. This can be achieved by implementing solutions that hurt the environment less and/or improving energy efficiency. The interrelation is shown in Figure 2.14.

Figure 2.14. The interrelations of energy, growth and pollution



While access to energy and its use stimulate development which translates into social well-being and prosperity, extraction of fossil fuels and production processes cause serious environmental problems. With greater prosperity the dependence on energy increases exponentially. This, in turn leads to environmental pollution, degradation of ecosystems and health problems, which implies the situation needs to be remedied, energy generation and resources taken under control and new solutions designed. They involve shifts to renewable resources, improving energy efficiency and adopting eco-friendly mindset and behavior patterns.

Renewable energy as generated by more natural processes may still have some spillover effects. While there may not be a perfect solution, the main objective should be optimising energy sources and use as well as minimizing hazard to the environment.

While the process of energy transition is ongoing and irreversible, its complexity, depth and scope make it a challenging and multidisciplinary issue. It is not only about shifting from one source to another but about **consequences** much more far reaching than the energy sector. The shift is likely to affect global geopolitical, macroeconomic as well as social sphere to high extent. Geopolitical reality is going to be reshaped after more than one hundred years of conventional resources modelling the map of energy. Moreover, expansion of renewables can be a “vehicle of democratization” through decentralization of energy supply leading to empowering citizens, local communities and cities (IRENA, 2019).

There are a lot of issues to deal with when choosing the **path** to energy transition. Apart from economic considerations, there are social dilemmas that need to be tackled. Often, these require compromise as for the pace of the changes and their scope. An important issue refers to job cuts in extractive industries, redundancies and dying out of regions historically based on conventional resources’ exploitation.

Environmental problems can develop into a political cross-border dispute between neighboring countries such as Poland and Czech Republic over Turów brown coal mine escalated in 2021. The mine is reportedly supposed to have negative impact on land, waters, and air pollution in the north Bohemian region leading to health problems, affecting well-being of its inhabitants and agriculture.

Investment in new **infrastructure to harvest renewable resources** is costly, but for poor countries is not only a financial issue. The developing world claims economically developed countries while inserting pressure on increased pace of

the transition should not do it without offering support. It was the developed world, after all, that contributed to the dramatic depletion of natural resources as well as devastation to the environment, therefore it should take the responsibility of mitigating the effects.

The path taken by developing economies results from their own strategies and logic of investment in the most socially important areas, such as ensuring access to affordable energy which, in their case, often means based on fossil fuels. Moreover, an embarrassing topic to be resolved is the toxic waste exports from rich to poor countries, the side effect of expansion of electrification (expired batteries), and intensified use of electronic devices, etc. Financial considerations of the business lobby and particular interests should not prevail over global benefits that should be addressed from a broad and inclusive perspective.

There are two scenarios of the energy transition: slow and rapid as for the path followed. “Rapid advocates argue that the emerging markets will enjoy an energy leapfrog to new energy technologies and significantly less energy-intensive forms of economic development, while providing critical improvements in the quality of life“ (World Economic Forum, 2019).

While country leaders globally agree as for the nature of the transition, they still disagree as for the pace of the changes likely to happen.

Renewable energy sources are measured against the fossil fuel backdrop. However, energy generation based on the two has different characteristics, for example the ratio between investment and operating costs is different. The transition is not only to be based on new systems, technologies, networks, transfer and storage, but requires proper education and know-how.

All in all, the issues to be overcome involve inertia of the industry, legislation and consumption. Therefore, they should be approached both globally as well as locally and from individual countries’ perspective. They have to consider investments, prepare for implementing new business models and shaping new consumption patterns. Legislative processes should enable adjustment following the framework determined by global policy.

Energy transition is likely to affect labor market. The study by IRENA (2020) estimates the number of jobs in the renewables sector in 2019 at 11.5 million while at the beginning of the second decade this number was under 7.3 million.

From the perspective of job market transition will also lead to creation of “green” jobs. New jobs when offered far away from residential areas may lead to intensified commuting. The issue should be viewed in the context of commuting

costs so as energy transition would not contribute to increased distance between employee's home and work resulting in growing emission from transport.

The term sustainable energy implies that in order to generate all energy demand different sources will have to be used. This is particularly important from the perspective of numerous underdeveloped countries where fossil fuels are available and cheap, as well as more developed countries with rich deposits and tested extracting technologies. The transfer to renewable sources is necessary, but its rapid pace would involve too many additional expenses, such as building infrastructure to process, generate and store energy as well as intangible social issues resulting from potential job losses and individual households' investment in appropriate fixtures enabling participation in the system. Thus, energy sustainability embraces renewables as a main source, but fossil fuels (in particular of lower CO₂ output) and nuclear reactors will also need to remain provided that the long-term environmental effects are not left unattended but controlled and monitored leading to adjustments made to ensure the future existence of the systems is not compromised.

It is important to note that nuclear energy generation also needs to be supported by fossil fuels because the lifecycle of the nuclear fuels requires inputs of the former at various points. Additionally, its storage, use and waste need to be safeguarded, including long term measures.

It should be stressed that price is expected to remain a primary determinant of energy sources selection, in particular for the poorest as well as rapidly developing parts of the world. Fossil fuels and biomass are known to be the least expensive (as calculated per unit of energy), while their environmental consequences (greenhouse gas, pollution) that generate costs to the society – individual's health and well-being – have been usually ignored. While fossil fuels might seem to be cheap considering the input to generate certain amount of energy, the side effects of their exploitation and emission are likely to be significant causing serious health problems. These should be estimated to establish the real cost of generating energy from one source or another. Human well-being may be affected by changes to and intervention with the environment by construction works and elements of infrastructure in the vicinity of housing estates or natural resorts.

Social response to reduction of pollution and halting climate change while mostly positive, reflects concerns and resistance to solutions that could generate additional costs. In June 2021 a referendum was held in Switzerland whose authorities planned to levy additional tax on flying and driving as activities generating most pollution. 52% voters opposed to the idea expecting higher costs for motorists, including airline tickets, petrol and diesel (Climate Home News, 2021).

Interestingly, while greater connectivity has a lot of positive social effects, its influence on the environment is negative. **Data centers** are highly **power intensive**, their demand on energy amounts to over 90 billion kilowatt-hours of electricity annually.

It is estimated that by 2027 3.5% of global emission will be traced back to the **internet-connected devices** and by 2040 their share will account for 14% (Vidal, 2017).

Internet traffic was expected to triple in the period 2017-2022 resulting from increased number of users and broader scope in developing countries and AI, IoT, robotics, autonomous cars, etc., on the rise in developed countries. The data for the technological solutions need to be stored, the purpose addressed by "hyper scale" server farms of a huge scale. For example, one Apple center built for \$ 1 billion is expected to use 300 MW of electricity, equivalent to 8% of the national capacity and more than the daily entire usage of Dublin (Vidal, 2017).

Companies that provide internet services, in particular running data centers try to resort to renewable energy. For example, Aruba S.p.A in Italy with over 2 million domains, and 5 million customers established its newest center in partnership with Hitachi group FIAMM in Bergamo. The site was selected because it offers access to a photovoltaic plant (aka solar park) as well as a hydroelectric dam. This partnership joining innovation and sustainable solutions provides for 100% renewable energy needed for the center's operations.

Similarly, Microsoft decided to elaborate on the idea of data centers based on the sea floor, the concept which provides for energy (tidal turbines and wave energy converters) and simultaneously cooling. Such system located at a coast additionally enables internet efficiency and speed for users living 120 miles of the coast, who account for over half of the world's population (Hitachi, n.d.).

Apparently, economic, social and technological development will demand strategic and managerial skills to constantly consider and apply such options which fit into the pattern of sustainable energy use.

KEY TERMS

Energy resources, energy generation, energy demand and supply, fossil fuels, decarbonization, renewable sources, smart grids, energy efficiency, energy transition.

SUBCHAPTER SUMMARY

While energy consumption per capita is an indicator of standard of living and development, its increasingly important role is to enable improvement in life-style and welfare, social security, and other aspects that all contribute to energy sustainability. The increasing demand on energy parallel to economic growth brought about a worldwide crises affecting climate change and environmental destruction. The issues have been given unprecedented attention as demanding urgent and radical action. According to the objectives set in the European Green Deal by 2050 the EU intends to become climate-neutral and benefit from sustainable transition.

While there are a lot of barriers to be overcome on the way towards green transition, intensified, consistent strategy has been found effective. Statistics show increasing share of renewable resources in energy production. The transition has to be supported by research and development to provide for improved efficiency, limited side effects, solutions to store and transfer energy. New approach and novel technologies may contribute to reducing emissions and accelerate the transition.

The use of renewable energy has many potential benefits, including a reduction in greenhouse gas emissions, diversification of energy supplies leading to energy security, creation of jobs in new “green” technologies.

While in the developing world access to energy is an issue to be addressed, for countries with higher level of economic and social development the focus is also on intangible aspects, such as well-being, happiness, security, comfort, satisfaction and health. Such aspects are derivative to and interrelated with energy access, consumption and security and may lead to meeting Sustainable Development Goals.

DISCUSSION QUESTIONS

1. What are the typical energy mixes in the European countries? Which countries have resources that allow for different mix?
2. Which EU countries rank highest as for the cleanest electricity grids?
3. What are the issues of equity and justice in reference to energy use, types and emission?
4. How can development and inclusion be limited by insufficient access to energy and its consumption?

5. What are the potential uses of Artificial Intelligence in smart grids? What obstacles need to be overtaken?
6. What is renewable energy markets growth potential following global patterns of energy production and consumption in the 21st century and energy security?

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2.1.3. Industrial agriculture

Ilaria Colivicchi^a

LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- recognize the main aspects of industrial agriculture,
- understand the impact of industrial agriculture on society and economy,
- know the consequences on the ecosystem of monoculture,
- identify the main characteristics of CAFOs and their impact on the ecosystem,
- identify costs for the ecosystem.

What is industrial agriculture

The beginning of globalized industrial agriculture must be analyzed in the long term with the imports in Europe of products from the colonies in a political context that dates back to the era of colonialism. At the same time, the dominant

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contemporary aspects come from significant agri-food system changes over the world that began in the 1980s for capitalist accumulation.

A fundamental step towards the agri-food system renovation was the liberalization of agricultural markets. In 1974 the FAO (Food and Agriculture Organization is a United Nations institution to contribute to increase nutrition levels, agricultural productivity and to improve global economic growth and the lives of rural populations in their area) declared that, to ensure good nutrition for the world population, it was necessary to increase production and liberalize the markets. From the 1980s on, these intentions will be discussed more concretely.

In 1986 the “Uruguay Cycle” began and for the first time the agricultural sector was integrated into the discussions among the countries of the General Agreement on Tariffs and Trade, better known by the English acronym GATT (international agreement to establish a multilateral system of commercial relations to liberalize world trade) about the multilateral trade negotiations. In 1995 the World Trade Organization (WTO) borne to control the fulfillment of individual states towards multilateral negotiations. The new scenario has contributed to the success of multinationals which directly or indirectly controls all the phases of the agri-food chains, from research and sale of biotechnological and transgenic products to production, from transformation to distribution (McMichael, 2005). In particular, distribution has become a preponderant element in the current contemporary agri-food system.

Starting from the second half of the twentieth century, agriculture has changed radically, for the rise of the industrial society strictly connected to a deep technological development, massive population growth, and global urbanization. These fast evolutions have caused an extraordinary increase in the demand for food which has resulted in a strong environmental impact.

Furthermore, the trend outlined above does not exclusively concern the countries of the Northern part of the world but is also spreading to countries with emerging economies, intensifying environmental imbalances and causing the birth of new conflicts for natural resources.

The agri-food system plays a primary role in a more sustainable development model. Scientific evidence has shown that the style of food consumption has a significant impact on the environment and in the economic and social sphere (Morgan, Marsden, & Murdoch, 2009; Seuneke, Lans, & Wiskerke, 2013). Indeed, even today hunger and malnutrition remain two enormous unsolved problems, while, at the same time, overweight and typical diseases related to poor

eating habits represent a significant expense in national health services. We can affirm the possibility of great margins for improvement in the global food system and the various local systems connected to it.

The dominant model of economic development, based on the unbridled use of the planet's resources, and the globalization process that has radically changed the lifestyle of societies, are responsible for serious consequences in terms of the environment, quality of life, and even nutrition. It is undoubtedly true that, on the one hand, the progress and application of the agro-industrial system have ensured sufficient quantities of food to support growing populations, but on the other hand, they have contributed to environmental pollution, as well as to aggravate social and economic problems.

Industrial agriculture is an intensive production of crops and animals often with the use of chemical fertilizers on crops or the use of antibiotics in animals to produce on the large scale. Antibiotics in fact in some farms are given to cope with bad hygienic conditions even if the animals are healthy. Crops can be often genetically modified and pesticides used to achieve large-scale production.

These practices are just some of the best known but many others contribute to impoverishing the land and some of them are real exploitation rather than animal husbandry. All of these practices impact human health and increase various forms of pollution. In recent decades, agriculture has undergone the so-called vertical integration which consists of the transition from small diversified farms to an industrialized system dominated by large multinationals.

The loss of farms that produce various crops and raise different types of livestock has had a deep impact on society and the economy; small farmers and ranchers are unable to remain competitive in the market and are incorporated by multinationals that drain all profits. Industrial agriculture has caused a drastic reduction in the number of employees in the primary sector, a reduction in agricultural land in terms of quantity and quality, deforestation, and pollution of water, air, and soil. In the long term, the industrialization process in agriculture has caused a series of problems that can be classified by referring to the three main aspects generally considered in the concept of sustainability:

- Environmental impact: crops and intensive farming release huge quantities of chemical fertilizers and pesticides into the environment, as well as climate-altering gases, causing soil erosion and salinization and depletion of aquifers, with a strong impact on stability ecosystems and biodiversity loss.

- Social impact: the safety and food sovereignty of entire countries is often jeopardized, the healthiness of food is threatened, while the separation of places of consumption from those of production increases, urban metabolism grows, threats to animal welfare increase from breeding.
- Economic impact: they concern both consumers and producers. The expansion of economies of scale, the high intensity of capital, and the low intensity of labor, the pursuit of profit that exploits local economies can threaten the survival of some rural communities, especially in the southern hemisphere, or of small businesses.

Globalization and trade liberalization, large retailers and intermediaries in general direct producers towards strong price competition and push them to exploit natural resources or work more intensively, being crushed by the so-called cost-price squeeze phenomenon (Maye, Holloway, & Kneafsey, 2007). This, on the one hand, puts non-industrialized and standardized producers in difficulty, on the other hand, it risks providing the market with lower quality or less healthy products.

As part of an objective of environmental, social, and economic sustainability, some attempts and trends are taking place to promote and support local and sustainable food systems, with a whole series of initiatives that often start from consumers. Their genesis is to be found in growing attention to the issues of food healthiness, connected to the growing fear of food “scams” that we periodically hear about, to the increase in diseases typical of higher-income countries, and greater sensitivity and attention to the socio-environmental impacts of the agri-food system. The so-called peasant or traditional agriculture is still today the most practiced cultivation model in most of the rural societies of Asia, Africa, Latin America, and part of Mediterranean Europe. It is agriculture that occupies a large portion of the population, mainly small owners with reduced production capacity and aimed at self-consumption.

In the industrially advanced countries, however, an agro-industrial system is widespread and has established itself especially after the second half of the twentieth century. This system, unlike the peasant one, which is distinguished by its multicultural nature and its dependence on natural conditions, operates a de-territorialization, largely disconnecting food production from the local environment, from seasonality, and local cultures. It can be said that the costs of conventional agro-industry are often outsourced to the area in which it is practiced.

More than a hundred years ago, Kautsky (1988) underlined the profound evolution of the primary sector during the nineteenth century, emphasizing how capitalism entered the sector, supporting the process of internationalization of production, liberalization of markets, and global competition. It is precisely within this mechanism that the peasants themselves became an instrument of agro-industrial capital. The industrial agriculture model has pushed agricultural enterprises to adopt capital-intensive technologies to intensify production, based on a strong use of capital, machinery, pesticides, chemical fertilizers, and genetically modified crops (GMOs) with the sole purpose of increasing the productivity level per hectare. This model has then dramatically increased the size of companies, has directed producers to specialize in a smaller number of operations and processes, and has exerted ever greater pressure towards achieving objectives of maximizing profits and yields (Gale Johnson, 1975).

In the current canons of industrial agriculture, the debate about the problems of this model in terms of sustainability is not absent but is often placed in the background through the trust in technology, which is called to solve the problems of global under-nutrition and to address the food needs of what is the projected world population of nine billion people by 2050. It is likely that higher productivity can be achieved in the future but with fewer environmental impacts (Garnett & Godfray, 2012). By betting on technologies to increase productivity, the issue relating to the distribution of agricultural land and soil erosion and consumption risks taking second place. The multinationals producing the main commodities or the governments of some countries are buying land from the poorest countries, giving rise to the phenomenon of land grabbing: often lands that are traditionally inhabited and used by local communities to grow their food are sold by local governments and fenced off.

Large multinationals control a large part of the world market. Monopsony has allowed them to impose purchasing conditions on producers and processing companies and thus have the greatest decision-making power among the various components of the agri-food sector (Burch et al., 2005). These conditions were also determined by taking into consideration the criticism of the agri-food multinationals by an important slice of consumers, and the growing demand for a healthy diet, based on fresh fruit and vegetables and organic products.

One of the successes of the distribution multinationals was precisely that of absorbing criticism and acting as a guarantor of product quality. This was possible thanks to the imposition on agricultural producers of private quality assurance and food safety certifications to standardize products, as well as thanks to the

creation of their brands of quality products. The current agri-food system is thus a hybrid system, at times contradictory, dominated by multinationals, a corporate-environmental food regime, in which the logic of production and post-production coexist according to the principle of just in time and the diversification of production based on consumer questions (Friedmann, 2005). This, however, places a great burden on individual agricultural producers, who have to negotiate prices with a few large distribution chains, knowing however that the latter can source their supplies in a global market.

Furthermore, farms must supply large quantities, but at the same time adapting to the requirements imposed by private certifications of quality and food safety, whose criteria also require continuous and expensive updating. The general trend is therefore that of the concentration of the number of companies able to meet these needs.

What monoculture means

Monoculture is an agricultural production process that consists of dedicating vast areas of the territory to the cultivation of a single plant species, in an intensive and standardized manner, to maximize yields and obtain maximum profit. Often this standardization is accentuated by the use of a few very productive but also very demanding varieties and by the massive use of synthetic fertilizers and plant protection products.

Figure 2.15. Crops



Source: pixabay.com (author: Manfred Richter).

Sowing only one crop on the same agricultural land every year is an extremely harmful practice for soil health as it depletes its nutrients. The same parasites of the plant that is repeatedly cultivated are discouraged to change territory in the expectation of the same planting. To cope with both the presence of parasites and the loss of quantities produced due to poor fertility, large quantities of synthetic fertilizers are therefore used. However, the cycle does not end since, in the long run, the same chemical fertilizers contribute to further degrading the soil. After harvesting, the soil remains without any other cultivation and becomes highly attackable by the phenomenon of erosion.

Monocultures spread in the epoch of the first colonialism: the colonizing countries needed exotic agricultural products that could not grow on the national territory (spices, coffee, cane sugar, exotic fruit, etc.), and so they exploited the climatic conditions of the countries colonized to intensively produce what they needed. Spice cultivation spread to India, tea cultivation on the island of Ceylon, cocoa in Latin America and Ghana, sugar cane in the Antilles, bananas and peanuts in Central America, and coffee and rubber in Central America, Brazil.

Whole nations, poor and underdeveloped, were forced by governments and large foreign companies (the US and European), under the threat of arms or with the help of ruthless constraints, to cultivate a single species of agricultural product, so that they had to sell at a low price what they produced only to the country that exploited them, and to buy, at a high price, all the other foodstuffs needed by the same exploiting country. Therefore, for rich nations as well as for pure economic enrichment, monoculture established itself as a political tool to maintain a position of dependence.

The term monoculture can be extended to the intensive rearing of livestock; or to the extraction of a specific mineral (in this case the country rich in this mineral is completely used for its extraction and processing, leaving no room for other forms of industrial production and processing).

What are concentrated animal feeding operations or CAFOs?

The CAFOs are facilities that perform Concentrated Animal Feeding Operations; these factory farms are in general large and industrialized facilities raising animals for food with a very large number of live animals crammed for more than 45 days per year and feeding it inside the fences instead of making them freely

grazing. According to the Regulatory Definitions of the U.S. Environmental Protection Agency (EPA) a “large CAFO” typically has at least 1000 beef cattle, 700 dairy cows, 2500 large pigs, or 82000 egg-laying hens. We can have even medium-size or small CAFOs using different definitions of the same regulation (Regulatory Definitions of Large CAFOs, Medium CAFO, and Small CAFOs, n.d.).

Figure 2.16. Chickens



Source: pixabay.com (author: Xuân Tuấn Anh Đặng).

As reported in 2019 by the NRDC (Natural Resources Defense Council) that works to safeguard the Earth research finds that most CAFOs were not monitored for the number of intensively reared animals and the amount of waste produced. CAFOs are recognized as industrial polluters and, to achieve large-scale food production, implement practices on farmed animals at the limits of human beings such as tail docking without painkillers or shutting laying hens in battery packs in such small and crowded cages that these are unable to move for their entire lives.

Although the situation of CAFOs and their lack of interest in animal welfare is known today, studies conducted by numerous entities engaged in environmental sustainability revelations show that CAFOs remain highly harmful to the environment and the health of neighboring communities. CAFOs are very numerous throughout the United States. The states with the most CAFO-derived animals are in the Midwest of the United States.

The European Union is a leader in the proposed reforms for CAFOs. The Farm Animal Welfare Council (FAWC), an independent advisory body set up by the British government, in 1997, produced a key report in which the principles of the previous 1965 Brambell Committee Report (Association of Shelter Veterinarians, 2009) known as “The Five Freedoms” are adopted. The principles indicated constitute the core for organizations that fight for the rights and welfare of animals and therefore for human health. The five freedoms are (for more information CAFO’s book in the references):

- freedom from hunger and thirst,
- freedom from discomfort,
- freedom from pain, injury, or disease,
- freedom to express normal behavior,
- freedom from fear and distress.

Figure 2.17. Pigs



Source: pixabay.com (author: Peggy Choucair).

The animal must be guaranteed a balanced diet to maintain its physical and mental health, an appropriate environment with sufficient space for physical development and coexistence with other elements of its species, any medical care if necessary. As M. Scully wrote in *Dominion 29* (2002) “Genetically designed by machines, inseminated by machines, fed by machines, monitored, herded, elec-

trocuted, stabbed, cleaned, cut, and packed by machines – themselves treated like machines ‘from birth to bacon’ – these creatures, when eaten, have hardly ever been touched by human hands.”

Manure produced by CAFOs is the main source of pollution (Overcash, 2011). It is generally a natural fertilizer, but the quantity produced in CAFOs is so large that the surrounding fields cannot absorb it completely, creating pollution of the soil, water, and even the air. Analyses conducted by the EPA have shown that nitrate derived from manure is the most common agricultural contaminant in drinking water wells and, if left on the ground in a highly concentrated way, instead of being a fertilizer it is toxic.

CAFOs produce, in addition to manure, a large amount of waste whose methane emissions pollute the environment contributing to global warming, as evidenced by the 2006 report of the United Nations Food and Agriculture Organization. Waste emissions can cause physical and mental health impacts in humans (airway diseases, occupational asthma, and hydrogen sulfide poisoning).

Antibiotics in CAFOs are also used for non-therapeutic purposes to prevent diseases deriving from antigenic conditions and the overpopulation of the premises. Studies have shown that the meat produced could itself be a problem for human health. Animals that do not graze freely on natural grass may have higher levels of total and saturated fat and cholesterol which can in the long run create negative impacts on cholesterol, human cardiovascular diseases.

Impact of industrial agriculture and dangerous practices

The effects of industrial agriculture and CAFOs on the environment are very important. Monoculture impoverishes the soil, renders it scarcely fertile, and subject to severe erosion and the biodiversity of the cultivated species is lost.

The use of pesticides is particularly used in monoculture given the strong radicality of the infesting element in the area while waiting for a subsequent harvest similar to the previous one. Monoculture has also favored genetic modification (GM) over time. Producing GM crops that can withstand pesticides allows farmers to be able to act indiscriminately without damaging the good yield.

Very often we hear about genetically modified organisms (GMOs) and today the acronym has taken on negative connotations. However, consider that man has genetically modified plants for a long time through the so-called selection. This

technique consists of selecting the best seed generation after generation to obtain a higher-quality product while preserving its physical characteristics. The process of such selection is therefore natural but very slow. Nevertheless, genetic modification can also be carried out in laboratories. In this case, the researchers identify the genes to be selected based on the characteristic that needs to be improved, but the gene often does not come from the same living element that needs to be changed, it can come from a different plant or animal species. After identifying the useful gene, the researchers duplicate the genetic code to insert it into the species to be modified according to different techniques to integrate this genetic information with the DNA of the original organism.

Scientists recently studied a technique for transmitting the modified gene with the help of agrobacteria. These microbes in their life cycle enter plant cells to deposit a genetic sequence in their DNA so that the plant is induced to produce sustenance substances for the agrobacteria themselves. By exploiting this natural aptitude of agrobacteria, the researchers ensure that they introduce modified genes into the DNA of plants that, for example, increase tolerance to pesticides, or make the plant tolerate greater drought, or simply modify its physical appearance and/or organoleptic components. The transgenic plant is then grown to ensure that the new genetic sequence is passed on correctly. When the modified plant is a food product, albeit genetically modified, it is tested to check that it contains the same nutrient levels as the original, but it can often be said to be just as safe for those who take it. It is therefore possible to highlight long-term health risk profiles that are difficult to diagnose *ex-ante*. Trade associations have fought for the products marketed to have a label indicating whether the food contains GMOs or not. Similar genetic modifications can also be made in the course of cattle breeding. The presence of GMOs has an enormous impact on environmental and social point of view over the years.

Some studies conducted on the condition of the soil in the Midwestern United States have shown that the use of glyphosate-based pesticides in large quantities has caused strong destruction of the euphorbia plant which is the main sustenance food of monarch butterflies. As a result, the monarch butterfly population has decreased by over 80% over the past 15 years. Considerable impacts are unfortunately also had on human health; recent studies confirm that the use of these pesticides can increase the onset of cancer but also other diseases related to fertility and the development of the human embryo.

Furthermore, monoculture contributes, together with CAFOs, to making the waters more polluted and to increasing greenhouse gas emissions. Cow manure

produces methane and nitrous oxide to which are added nitrogen-based fertilizers and pesticides. Studies on the health of workers in CAFOs were conducted and significant risks associated with antibiotic-resistant bacteria were found (Johnson & Kar, 2019).

In 2019 NRDC studied the impact of the campaign against the indiscriminate use of antibiotics on livestock and found that large American restaurant chains and farms have lined up to introduce a brake on the use of antibiotics on slaughtered meat (Brook, 2019).

The main objective that industrial agriculture has set itself and that has led it to such great development is to achieve high efficiency to allow food production to support the rapidly growing global population. By adopting economies of scale, industrial agriculture allows the sector to be profitable, which unfortunately does not apply in general to small and medium-sized farmers.

In the logic described above, in reality, every consideration is neglected regarding the costs, even high, those rural communities, subjects involved in large-scale agricultural production, the different industrial sectors. Also, and certainly not as the least important condition it is to bear ecosystem as a whole in which future generations will find themselves acting. If we included in the determination of the effective cost all the externalities connected to industrial agriculture, it would appear that this production system certainly does not represent an economic, sustainable, and even less healthy process. However, there are alternative processes of development towards modern intelligent agricultural systems that could reduce many of the costs associated with industrial agriculture mentioned above (Union of Concerned Scientists, 2008).

We can divide the costs into three main categories: Human health and safety costs, Agricultural and environmental damage costs, and Social and economic impacts. Focusing on the costs for Human health and safety, industrial agriculture has significant impacts on the health of farmers, of the people who live in the neighboring areas, and also for the final consumers. Among the most evident we remember:

- Toxicity. The use of chemical pesticides and fertilizers frequently leads to poisoning and long-term illness.
- Water pollution. Fertilizers that are released onto the ground and into the air contaminate the water tables and can damage the drinking water basin. Reclamation costs must be incurred for the restoration of groundwater.

- Junk food. Industrial agriculture, producing large quantities of food raw materials (corn, soy, wheat) has an enormous impact on food and therefore on health.
- Antibiotic resistance. The heavy use of antibiotics in CAFOs has developed antibiotic-resistant bacteria.

According to the agricultural and environmental damage costs, we need to stress the fact that industrial agriculture aims only at the dimension of production and therefore exploits fertility as a resource to be exploited, without taking into account the deterioration that this *modus operandi* proposes. The main costs to be incurred are:

- Soil deterioration. Monoculture depletes, as previously highlighted, the fertility of the soil which cannot be regenerated without biodiversity.
- Irrigation. Soils that are depleted and not cultivated until the next harvest cannot withstand drought and are therefore more fertilized (huge irrigation costs).
- Erosion. Monoculture compromises the integrity of the soil and therefore more friable and subject to degradation. For it to be used again, the soil must be subject to reclamation but its value decreases over time.
- Biodiversity loss. Monoculture ceases to allow biodiversity to coexist in the ecosystem and changes the very appearance of the landscape.

Large-scale production has a strong social and economic impact on neighboring communities. It can be often observed:

- Closure of small to medium-sized farms. The number of small to medium-sized farmers has been extremely small, failing to be competitive in the market.
- Damage to neighboring economies. Large-scale agriculture also has an impact on industrial sectors that contribute to the integration of the production cycle as well as, for the emissions described above, on the neighboring territories due to the consequences caused by the emissions themselves.

Similar considerations can be made for the CAFOs that contribute to the creation of pollution problems.

Conclusions

Over the past decade, industrial agriculture and CAFOs grown enormously in some areas of the planet to support a strong demand for food and related sectors. The techniques used to develop large-scale agriculture and to raise livestock in large quantities and in rapid times have brought negative impacts on human health and the safety of the ecosystem which lead, from an economic point of view, to real costs to be support. These costs are strictly linked to soil deterioration and the need for irrigation and fertilization of it, erosion and loss of biodiversity, pollution.

In this situation, what can we do? In the following paragraphs, some innovative smart solutions will be presented for sustainable agriculture.

KEY TERMS

Agriculture, CAFOs, farm, industrial agriculture, large scale production, monoculture.

SUBCHAPTER SUMMARY

The strong growth and urbanization of the world population have caused an extraordinary increase in the demand for food which has resulted in an evident environmental impact. Agriculture in some countries changed towards an industrial agriculture where an intensive production of crops and animals is strictly linked to the use of chemical fertilizers on crops and antibiotics in animals to produce on the large scale.

These processes caused a lot of problems for the sustainability of the entire ecosystem. Three main impacts have to be considered: environmental impact, social impact and economic impact.

New risks appear according the soil deterioration and the necessity of a huge irrigation and fertilization of it, but erosion is not the only problem caused by industrial agriculture. Monoculture brings a loss of biodiversity that contribute to the soil deterioration too.

Small and medium-sized farmers cannot be competitive in the market and are forced to close. In CAFOs very often the heavy use of antibiotic developed anti-

biotic-resistant bacteria, produces a large amount of manure which impacts on gas emissions and therefore on pollution.

Some significant costs will be stressed on: Human health and safety costs, Agricultural and environmental damage costs and Social and economic impacts.

DISCUSSION QUESTIONS

1. What is industrial agriculture?
2. What are CAFOs?
3. Why is monoculture so dangerous for the soil?
4. What are the main costs connected to large-scale production?
5. How can CAFOs contribute to pollution?

TEACHING METHODS

- lectures,
- workshops,
- open group discussions,
- student presentations.

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2.1.4. Water scarcity: Causes and financial impacts

Federica Ielasi^a

LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- identify the main causes of water scarcity,
- identify potential solutions to the problem of water scarcity,
- argue about the UN Sustainable Development Goal No. 6,
- identify an environmentally sustainable economic activity,
- argue about the impacts of water scarcity at a financial level,
- comprehend the opportunities of a water mutual fund and a water Exchange Traded Fund,
- understand the opportunities and the threats of investing in water derivatives.

Introduction

Water covers 74% of the Earth's surface, but only 1% is drinkable. In 2010 the United Nations Assembly included access to drinking water and water needed for sanitation as universal and fundamental rights. Despite its abundance and despite being a fundamental right, water is increasingly a scarce resource. In many countries, the condition of water stress has become a situation of water scarcity, where water availability is not able to cover water uses.

In this Subchapter the problem of water scarcity is analyzed to shed light on the main reasons that have led to an increase in the level of concern on the subject. Also some global initiatives that are helping to raise the issue are presented, and the impact of water scarcity in financial markets is studied, to set off an alarm bell on the potential risks of financial speculation on such a vital commodity. The analysis of the water scarcity topic and the initiatives for increasing the alarm on the issue are particularly relevant today: though it is vital and scarce, we sometimes treat water as if it is worthless.

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Water scarcity can mean scarcity in availability due to physical shortage or scarcity in access due to a lack of adequate infrastructure, or the failure of institutions to ensure a regular supply. Physical shortage and supply-side inefficiencies are usually combined with an increase in the water demand for agriculture, for industry, as well as for domestic purposes (Feige & Blau, 2005).

Many countries in arid and semi-arid regions, as well as developing countries with the highest population growth, are already close or have crossed the threshold for water scarcity of an annual 1,000 cubic meters per person. Despite household water accounts for only a small portion of water consumption, in developing countries also the access to drinking water and water needed for sanitation is still a big issue. “Some 2.2 billion people around the world do not have access to safely managed drinking water services, 4.2 billion people do not have safely managed sanitation services, and 3 billion lack basic handwashing facilities” (World Health Organization [WHO], 2019). These conditions have had serious consequences during the coronavirus pandemic. Indeed, safely managed water, sanitation, and hygiene (WASH) services are an essential part of preventing and protecting human health during infectious disease outbreaks. In particular, frequent and proper hand hygiene is one of the most important measures that can be used to prevent infection with the COVID-19 virus.

Nevertheless, even developed countries face rising costs to manage and deliver water: water is heavy and hard to move long distances and much of the water infrastructure should be replaced and fixed, also to reduce drinking water losses. Within developed countries, water stress conditions can vary to a consistent extent. The cost of providing drinking water varies significantly across regions since it is largely determined by local conditions such as the characteristics of the area to be supplied (urban versus rural, population density, plain versus mountainous), the quality and the characteristics of the raw water (groundwater versus surface water), the current state of the infrastructure, and the organization of the delivery network. Even where there is no problem with the quantity of water available, an issue can exist with the quality of the water. As an example, European river basins suffer the additional burden of fertilizer/polluted waste run-off from surrounding farmland/industries, and they have also been altered by such human activities as: water abstraction, land drainage, and dams. These often lead to major adverse ecological effects, drops in the quality of water, and an increase in management costs.

Consequently, water stress and water scarcity represent global concerns, due to several reasons that have impacted the water market: over the past fifty years,

the world's population has doubled, GDP has grown tenfold, and agricultural and industrial production has boomed. Besides, the economic development is based on more water-intensive patterns of growth, determining a high increase in water demand, in particular for irrigation and industrial purposes.

Water scarcity is exacerbated by environmental factors related to climate change. An increased frequency of extreme weather, increasing pollution, and rainfall variability severely impact the availability and quality of freshwater resources, causing water-related natural disasters, such as droughts and floods. All these factors are making water scarcity one of the greatest risks to sustainable development and economic progress. Global water demand might increase 55% by 2050, compared to 2015. Meantime, it is estimated that in 2030, global demand will exceed current sustainable supplies by 40%, with the largest increases coming from manufacturing, electricity, and domestic use (United Nations, 2018).

Since the systems for water collection, storage, treatment, and delivery are complex and costly to build and maintain, during the last decades a wide debate has developed on the public/private relationship in the ownership of water basins and the infrastructure network for water management and distribution.

Water relevance and its characteristic of public good, combined with water scarcity, produced strong legislation and regulation around the world, with relevant differences across countries. Taking the Italian case as an example, the current rules have changed the presumptions about the ownership of water (Carrozza & Fantini, 2016). In the past, watercourses were presumed to be private unless their aptitude to satisfy a general public interest. On the contrary, nowadays, watercourses are presumed to be public, unless their inaptitude to satisfy public general interests is proved. In particular, the sustainable use of water is taken into consideration. As an example, the use of upstream waters is allowed only if it is not prejudicial to the rights of the future generation to have an intact environmental heritage.

Considering the social functions of water, a particular legal regime usually characterizes also the property of infrastructures, as well as of water services. This issue has been affected by strong political and economic debates, which have led to the adoption of different solutions over time and in countries. These debates are contentious and ongoing in many geographical areas. On the one hand, the need to find new financial resources for renovating the existing water infrastructure and the search for higher efficiency in water management pushes towards the partial privatization of the water sector. On the other, the privatization of water infrastructure can potentially produce negative impacts, also including

some concerns on the property of water, favoring a major involvement of the public sector. More space for local government choices is often left in the field of water services, usually provided by corporates both publicly or privately owned. In this case, the arguments in favor of public management are usually related to better control of the service as well as the possibility of some tax exemptions. The European Union has been very active in this policy area since 1990, by trying to promote competitiveness in the markets of the local and national public services, such as water and energy.

The Subchapter continues with the analysis of the main causes of water scarcity in recent years, with a specific focus on developed countries. The rest of the Subchapter analyzes the impacts produced by water scarcity both at a regulatory and financial level.

Causes of water scarcity

The amount of water resources is fixed, meanwhile, water demand is expected to grow in the years ahead, causing water stress or even water scarcity. This phenomenon is conditioned by several factors, related to both the demand and the supply of natural resources (Feige & Blau, 2005). The first reason that boosts the increase in the demand is the rising global population: demand is increasing due to population growth, with a consequent increase in food demand. Other causes are related to economic growth and climate change (Gad, 2017).

These pressures are placing increasing stress not only on water but in general on finite, non-renewable resources, such as minerals and fossil fuels. Humanity currently uses resources at a rate 50% faster than they can be regenerated by nature. In particular, some raw materials are concentrated in small portions of the Earth's ecosystem and this determines a high international competition. For example, China, the EU, and the USA are all highly reliant on imports for the same materials, like niobium, chromite ore, platinum, palladium, rhodium, tantalum. Scarcity is then a problem that characterizes water as well as many other natural resources, and the sources of scarcity are similar for the different resources.

Despite the pressures on natural resources are interconnected, we can analyze each factor separately by focusing on water. First of all, economic growth is a “thirsty business” from the point of view of both corporates and households. Concerning corporates, water is a vital factor of production. The growth in water

demand is due to the expansion and modernization of the industrial base and the increased demands from agriculture. In particular, water for irrigation is very relevant in this field: around 70% of the global water withdrawals go to agriculture. Industry (including power generation) accounts for 19%. Finally, households account for only 12% (United Nations, 2018). Concerning households, economic growth is intended as improved standards of living and it is related to the expansion of urban areas and growing consumerism. The evolution of eating habits can impact water demands too: producing 1 kilogram of wheat requires between 500 and 4 thousand litres, while for 1 kilogram of beef it is up to 15 thousand.

In this context, the optimization of water uses through better planning, public tools and mechanisms, pricing and non-pricing incentives can help to improve the stewardship of water resources. As an example, mechanisms for managing scarcities and competing demands include allocation tools, such as water rights and quotas, tradable permits, and licenses. The choices of public intervention, water protection regulations, and social protection systems (both formal and informal) can affect water availability and quality. Nevertheless, in defining these choices, it is important to remember that regulations and tools with high compliance costs could increase the risk of degradation and, for example, illegal groundwater pumping (Food and Agriculture Organization of the United Nations [FAO], 2020).

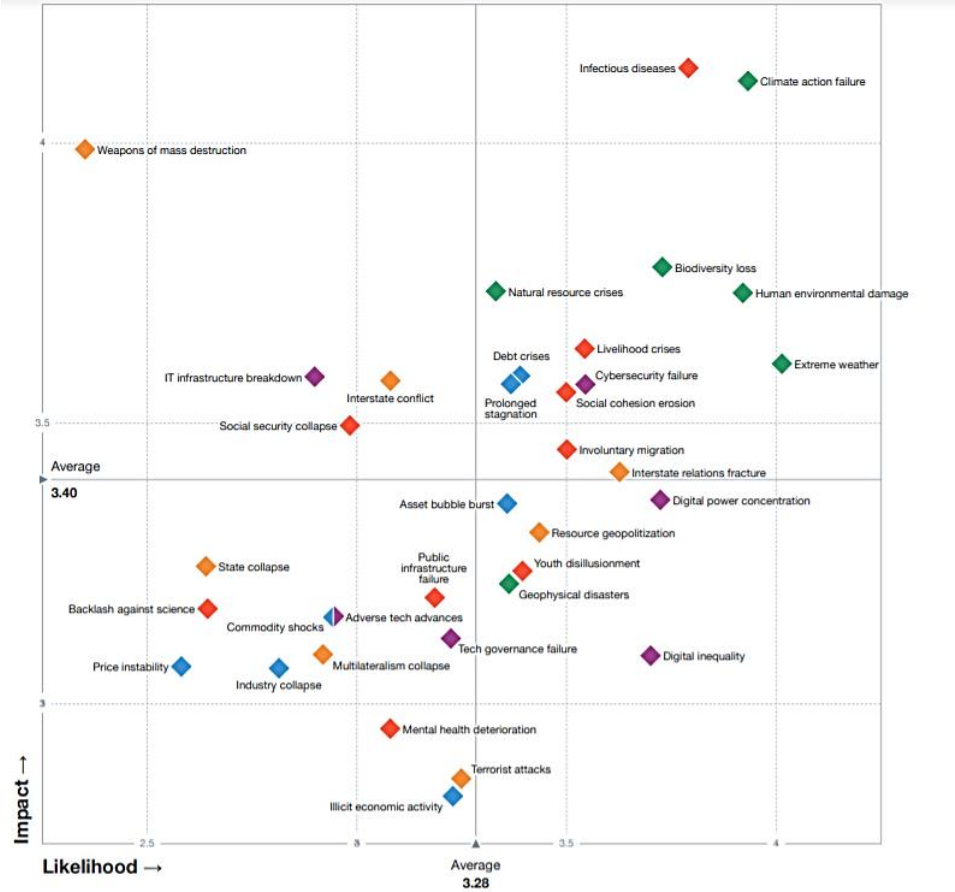
Another potential solution to the problem of water scarcity is provided by a transition to a circular economy. Nowadays, over 80% of global wastewater is discharged without treatment, in particular in lower-income countries. The application of a new economic model, based on the paradigm “reuse, recycle and resource recovery”, could help in reducing the problem of water scarcity, by providing some kind of treatment to wastewater. This is fundamental also for the ecosystem. For example, the introduction into the water of anthropogenic substances such as fertilizers, detergents, or wastewater of domestic or industrial origin, other than representing a source of pollution, is also the cause of another harmful phenomenon for the aquatic environment: the so-called eutrophication. This term is used to indicate the excessive growth of plant organisms, which occurs due to the presence in the aquatic ecosystem of too high doses of nutrients, such as nitrogen, phosphorus, or sulphur, coming from wastewater. Eutrophication is one of the leading causes of water quality impairment, alterations of marine species, and formation of dead zones (oxygen-depleted waters).

A further solution can be the incentive to the so-called “waterproofing” economies to limit the impact of extreme events and the uncertainties related to water supply in times of climate change. Indeed, the latter is an important source of water scarcity. While population growth and economic growth determine the demand for water rising exponentially, the supply becomes more erratic and uncertain, mainly due to climate change. It has made the water cycle far less predictable, and, consequently, water availability and water quality less reliable. First, the world is becoming hotter. Higher temperatures are increasing the rate of evaporation from land and plants into the atmosphere, leading to greater demand for irrigation water. Higher temperatures are rising sea levels, and, consequently, they are increasing the risks associated with storm surges and poor drainage in low-lying coastal areas. Higher sea levels also affect the quality of freshwater resources. At the same time, the world is becoming drier, and arid zones are continuing to expand. Moreover, devastating fires are becoming more frequent, representing a further cause of the growing water demand. Finally, the world is more hit by periodical natural disasters. The frequency and intensity of hurricanes and cyclones are on the rise, resulting in more violent and intense precipitation, and more recurrent flooding. Nine out of ten natural disasters are water-related.

According to the Global Risks Report 2021 by World Economic Forum¹, risks related to natural resource crises are among the main global risks for the next future. Compared to the risks perceived as materials for the next ten years, they have an average likelihood and a very high potential impact. In the Report, global risks are divided into six categories: economic, environmental, geopolitical, societal, and technological. Environmental risks are reported in Figure 2.18 with the green label. As shown in the figure, environmental risks are among the highest likelihood risks of the next ten years, with very relevant potential impacts. Among environmental risks, the participants at the survey, members of the World Economic Forum, included climate action failure, biodiversity loss, natural resource crises, human environmental damage, extreme weather, and geophysical disasters (World Economic Forum, 2021). All these risks are connected with water scarcity issues and climate change matter.

¹ Survey respondents were asked to assess the likelihood of the individual global risk on a scale of 1 to 5, 1 representing a risk that is very unlikely and 5 a risk that is very likely to occur over the course of the next ten years. They also assessed the impact of each global risk on a scale of 1 to 5, 1 representing a minimal impact and 5 a catastrophic impact.

Figure 2.18. Likelihood and impact of global risks



Source: World Economic Forum (2021).

Consequently, in the achievement of climate and development goals, water has to be at the core of adaptation and transition strategies. At the same time, ensuring a sufficient and constant supply of water under increasing scarcity is essential to achieve global poverty alleviation goals. For these reasons, several global initiatives, discussed in the following section, are helping to raise the issue of water scarcity.

Global initiatives that are helping to raise the issue

A growing global population, urbanization, increasing demand for agricultural and industrial production, economic growth, and climate change are putting water resources under ever-increasing strain. For these reasons, water is at the core of the interests of international organizations and regulators who intend to define sustainable development goals and promote sustainable practices across countries.

In this section, two initiatives are presented, one from the United Nations and the second from the European Union. The analysis of these relevant and international initiatives is important to understand the relevance of water for the identification and management of sustainability issues.

The first initiative is the 2030 Agenda for Sustainable Development, adopted by United Nations Member States in 2015. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries, developed and developing, in a global partnership. The Goals, summarized in Figure 2.19, recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve oceans and forests (United Nations, 2015).

Figure 2.19. The sustainable development goals



Source: United Nations (2015).

As shown in Figure 2.19, in the context of 17 SDGs, water is the core of Goal 6, aimed to “Ensure availability and sustainable management of water and sanitation for all”. This Goal, made up of eight specific targets, was reviewed in 2018 and is intended to be implemented by all countries and all stakeholders, acting in collaborative partnership.

The 2030 Agenda recognizes that social development and economic prosperity depend on the sustainable management of freshwater resources and ecosystems. Achieving SDG 6 is essential for progress on all other SDGs and vice versa. Sustainable management of water and sanitation underpins wider efforts to end poverty, advance sustainable development and sustain peace and stability (United Nations, 2018).

The targets included in Goal 6 cover the entire water cycle including:

- Target 6.1: Achieve access to safe and affordable drinking water.
- Target 6.2: Achieve access to sanitation and hygiene and end open defecation.
- Target 6.3: Improve water quality, wastewater treatment, and safe reuse.
- Target 6.4: Increase water-use efficiency and ensure freshwater supplies.
- Target 6.5: Implement integrated water resources management.
- Target 6.6: Protect and restore water-related ecosystems.
- Target 6.a: Expand international cooperation and capacity-building.
- Target 6.b: Support stakeholder participation.

These targets must be localized and adapted to the country context. National governments must decide how to incorporate SDG 6 targets into national planning processes, policies, and strategies, and set their targets, taking into account local circumstances.

To track progress towards the eight global targets, eleven global indicators were selected by the Member States. As an example, an indicator measures the water use efficiency, defined as the value-added in US dollars per volume of water withdrawn in cubic meters, by a given economic activity. Some sectors, for example, agriculture, industry, energy, and municipal water supply are particularly relevant due to their high water use.

To measure the indicators, it is necessary to have robust, verifiable, and comparable data. Data underpin good water governance. Less than half of Member States have comparable data available on progress made towards SDG 6 targets.

A useful contribution to measures on this topic is given by AQUASTAT, the FAO global information system on water resources and agricultural water management. This system collects, analyzes, and provides free access to over 180 variables and indicators by country from 1960. AQUASTAT plays a key role in the monitoring of Goal 6 and in particular of indicators on water stress and water use efficiency (FAO, 2020).

Moving to European initiatives, in this section, a recent Directive issued by European regulators is presented: the Regulation EU 2020/852, also known as EU Taxonomy Regulation, is presented (Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020). This rule includes, among others, water and marine resources among the environmental objectives of the EU. This taxonomy was set up for proving a common definition of which economic activities can be unequivocally regarded as eco-sustainable, to standardize definitions in the field of sustainable finance, threatened by greenwashing marketing policies. Specifically, the European Commission appointed in 2018 a Technical expert group on sustainable finance (TEG) to assist it in developing the EU classification system to determine whether an economic activity can be defined as sustainable from an environmental perspective (EU Technical Expert Group on Sustainable Finance, 2020).

Figure 2.20. European environmental objectives



Source: European Commission (2020).

According to the Regulation, environmentally sustainable economic activities are those activities that “substantially contribute” to one or more of the six environmental objectives and not “significantly harm” any other objective defined by regulators and summarized in Figure 2.20. Consequently, an activity can be defined as sustainable, for example, if it can produce a positive impact on water and marine resources, without causing significant economic damage to other objectives (Do Not Significantly Harm principle). In the Directive, it is possible to verify the list of the activities able to be included in this definition (green list).

Impacts on financial markets

Financial needs in the water sector are very high, both in high-income countries and low-income ones. Funding is necessary not only for more effective use of existing resources and infrastructures but also for investing in new technologies able for example to reduce costs of water treatments and management of water waste. Moreover, it is necessary to consider funding needs for covering the annual costs of damage from extreme weather events, flooding, and water scarcity. Investing in water security should reduce these costs, other than environmental damages.

Consequently, new sources of finance, and better use of existing sources, are critical elements of an enabling environment. According to United Nations estimates, current financial resources are inadequate to achieve SDG 6, presented in the previous section. The current level of WASH financing is not sufficient to meet SDG targets aimed to achieve universal access to safe and affordable drinking water, adequate sanitation, and hygiene. The World Bank forecasts the annual capital costs of meeting SDG targets 6.1 and 6.2 as US\$114 billion per year. This does not include other SDG 6 targets. Nor does it include operation and maintenance, monitoring, institutional support, sector strengthening, and human resources (United Nations, 2018).

Regarding ordinary financing, we can distinguish three main major sources of finance in the water and sanitation sector:

- taxes from individuals and businesses,
- transfers, such as overseas aid, remittances, or market interest rate lending,
- tariffs by households, businesses, and governments.

Global capital financing, mainly for the physical service infrastructure, largely comes from governments and supranational organizations and institutions.

In developing countries, World Bank is the world's largest multilateral source of financing for water. It works closely with partners to achieve "a water-secure world for all", by sustaining water resources, delivering services, and building resilience.

Besides, the European Investment Bank (EIB) is one of the largest lenders to the water sector. It is making water security and climate change adaptation a priority in its lending activities. For example, it supports investments that increase secure access to water resources, protect against floods and other destructive water-related events, ensure the reliable provision of sustainable and affordable water and wastewater services. In 2020, EIB invested about EUR 4 billion in the water sector, resulting in improved sanitation for more than 15 million people, better access to safe drinking water for around 30 million people, and less risk of flooding for nearly 2 million people.

Other than increasing the role and effectiveness of traditional financial resources, it could be relevant to increase innovative sources of financing, such as commercial financing involving the private sector. In this section, we distinguish private funding from the banking sector and financial markets.

Banks are starting to approach the lending activities towards environmental projects in a different way compared to the past. Environmental risks are entering into the measurement of credit risk, affecting loan selection and pricing. For example, climate change may undermine the probability of default of borrowers in weather-dependent sectors, such as companies operating in the agribusiness sector, reducing both asset quality and profitability for banks in case of natural disasters and extreme weather events. In the same way, a loan granted for financing investments in new technologies, for example around delivering clean water, can benefit from positive financial consequences deriving from changes in green regulation or growth in market demand due to environmental sentiment. Climate-related risks are then a source of financial risk for banks, increasing or decreasing the creditworthiness of counterparties and the potential losses in case of their default. Consequently, bank loans to the water sector are more and more affected by environmental evaluations, other than by traditional economic and financial scores (CDP, 2021).

Financing the water sector creates opportunities and challenges for the banking industry. On the one hand, there are opportunities to grant loans to a sector with

growing financial needs, proving money to finance the green agenda. On the other, banks need to protect their balance sheets from uncertainty due for example to climate change, able to heavily hit the water sector (Gasbarro, Iraldo, & Daddi, 2017).

By considering risks specifically related to climate change, we can distinguish between physical risks and transition risks. Physical risks are the risks associated with the physical effects of climate change. They can be event-driven (acute) or longer-term shifts (chronic) in climate patterns. In particular, acute physical risks refer to those that are linked to specific events, including the increased severity of extreme weather disasters, such as cyclones, hurricanes, or floods. Nevertheless, chronic physical risks refer for example to sustained higher temperatures that may cause sea level rise or chronic heat waves. Natural disasters not only interrupt the activities of companies and households (increasing their financial vulnerability) but also helps to reduce the value of the assets pledged for loans. Consequently, environmental shocks may increase the number of nonperforming loans in the portfolio of banks that are particularly exposed to households or businesses in the areas most at risk. If the affected area was large or the event particularly intense, these effects could propagate through the whole banking system, affecting systematic risk through contagion (European Central Bank, 2020).

The second type of climate-related risks, referred to as transition risks, derive from the commitments made by the international community to stabilize the atmospheric concentration of greenhouse gases at a level that allows the increase in temperature to be kept below 2°C and to continue with the efforts to limit this increase to below 1.5°C compared with pre-industrial levels. In other words, transition risks are the risks derived from making adjustments towards achieving a lower carbon economy. They may entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change, also in the water sectors. Water and sewerage, like for example electricity, gas, transportation, and construction sectors, are particularly exposed to transition risks.

These risks materialize when mitigation policies, technological advances, or changes in the market sentiment or consumers' demand, especially if they are abrupt and unanticipated, lead to corporate value adjustments. In particular, transition risks occur when financial markets are harshly affected by the uncertainties related to the timing and speed of adjustments towards a low-carbon economy, as unexpected policy measures or swift changes in consumer preferences.

Both physical and transition risks affect the access to credit of households and businesses. Considering physical risks, extreme weather events can affect both the probability of default and the loss given default, the two main components of credit risk. Indeed, extreme weather events affect the production of households and businesses and make them more vulnerable in financial terms, reducing their capacity to repay the loans; at the same time, these events can impact the value of the guarantees issued. Moving to transition risks, climate change policies can affect the future performances for example of energy-intensive companies or companies for which the availability of specific materials, such as water, are essential to the production process. Consequently, also transition risk impacts bank credit risk (Berenguer, Cardona, & Evain, 2020; European Central Bank, 2020).

Therefore, environmental risks should be reflected in the risk ratings of the borrowers. Many financial institutions have not yet included environmental considerations in their credit risk models, while others are looking at ways to capture climate risks within the credit rating process, at least indirectly and qualitatively. Other banks, to mitigate climate-related risks, are including environmental considerations into limits and sector exclusion policies, both in their lending and investment activities.

Nevertheless, banks belonging to the category of ethical financial institutions have always been specialized in financing environmental and social projects, including green and societal considerations in their risk assessment processes. Indeed, ethical banks are born with a specific social or environmental mission and are based on a set of values that give priority to ethical and ecological choices, social utility, public interest, local development. The loans granted by these banks are aimed at creating a social or environmental benefit, to achieve a positive impact on society together with a sustainable financial return. Investments in the water sector can find in ethical banks a relevant source of financing (Cowton, 2002; Weber & Feltmate, 2016).

Anyway, also these intermediaries have to properly evaluate financial risks related to their loan portfolio. A sectoral specialization of banks is usually linked to better monitoring and higher quality of the loan portfolios. Nevertheless, ethical banks may be exposed to higher credit risk if the “worthy causes” among their borrowers are not financially sound. Moreover, ethical banks may be exposed to higher concentration risk due to the specialized nature of their lending. For example, an environmental bank that grants a lot of credit to the renewable energy sector would be strongly affected by the curtailment of renewable energy subsidies (Garonna & Spaolonzi, 2016).

Environmental and financial evaluations should be properly integrated, both in ethical and conventional financial institutions, to come to a judgment capable of reconciling the various factors that may affect creditworthiness.

The introduction of environmental considerations in the credit risk process is also incentivized by the regulatory authorities in Europe. The European Parliament, as well as the UK's Prudential Regulation Authority, indeed, have proposed to incorporate environmental considerations into banks' prudential frameworks, demonstrating Europe's leadership role in the development of green regulation. Consequently, in the next future, environmental risks may also influence bank regulatory capital, as regulators may incorporate environmental issues into banks' prudential requirements. The EU proposal also contemplates a preferential treatment for bank exposures to assets or activities with a positive environmental or social impact. This allows a regulatory benefit, in terms of minimum capital requirements for banks, linked to the financing of green projects, for example in the water sector (Berenguer et al., 2020).

Other than from banks, an important flow of funds for this sector can also derive from financial markets. Investments made by asset management companies and by other institutional investors can remedy infrastructure shortcomings and help to overcome water scarcity.

Most of the considerations made above on the loan portfolios also apply to financial investments. Nevertheless, in this context, speculation may potentially produce a dangerous impact on the water sector. Indeed, investors in the financial markets are not only relevant suppliers of funds able to cover the financial needs of water companies, but can also operate with short-term speculative objectives. In particular conditions, financial speculation could also find advantages linked to water crises. The speculation through financial securities is also because though water is a commodity, it cannot be bought directly in the way many other commodities can be. In other words, water is not a tradable good like oil. Consequently, to speculate on the price of this commodity, it is necessary to invest in the financial markets in related securities or funds.

Few exceptions can be found to this general condition. For example, Australia has a water market, called Waterfind, that facilitates the buying and selling of permanent and temporary water rights across key Australian irrigation regions. There are two main types of water rights traded on Waterfind: entitlements and allocations. Water access entitlements are rights to an ongoing share of the total amount of water available in a system. Water allocations are the actual amount of water available under water access entitlements in a given season. These dif-

ferent kinds of water rights traded allow for the efficient redistribution of water and the management of scarce water resources.

In general, with water scarcity, the number of opportunities to invest indirectly in water on financial markets is increasing. Investors have not only the opportunity to buy stocks and bonds issued by companies operating in the water sectors, including utilities and water treatment companies. In this section, three other ways to invest in this field, with mutual funds, Exchange Traded Funds (ETFs), and futures are presented.

Mutual funds are pooled investment vehicles that accept investors' money and invest it on a collective basis (they buy and sell securities in large blocks). The rationale for the existence of mutual funds is to achieve superior diversification through money and risk pooling, compared to what individual small investors can achieve on their own. Moreover, mutual funds can gain access to wholesale financial markets and instruments and, therefore, to potentially higher returns for end investors. Besides, they provide opportunities to invest in liquid shares. In particular, open-ended mutual funds sell new shares to investors and redeem outstanding shares on demand at their fair market value.

In the case of investments in the water sector, diversification benefits are particularly relevant, especially considering geographical diversification. Indeed, water investments are characterized by a great exposure to regulatory and political risks. In the developed world, water supplies are closely regulated, and governments are often both big customers and potential competitors of private companies involved in the supply of water services or products designed to conserve and purify water, impacting country-specific risks.

Investors in water mutual funds can also reach a high level of diversification concerning economic sectors. The asset allocation of water mutual funds is usually widespread in companies that contribute to the delivery, testing, and cleaning of potable water, but they can also include big users of water resources with exemplary practices. As an example, the companies included in the eligible universe of water funds can be divided into different subgroups, such as utilities, infrastructure outfits, technology providers, and efficient users.

Investors can find different kinds of water funds traded on financial markets, given their level of risk and their investment style. Mutual funds can be for example distinguished in passively and actively managed funds. The first, also called index funds, are financial products in which managers buy securities in proportions similar to those included in a specified major index. Index funds

involve little research or management, which results in lower management fees than actively managed funds. The bulk of the water mutual funds currently available to retail investors track indexes and are not actively managed.

Other than index funds, investors in the water sector can find on financial markets several specialized ETFs. These securities are designed to replicate market indexes too, but they originate differently compared to mutual funds. ETF shares are created when an institutional investor deposits a specified block of securities with the ETF. In return for this deposit, the institutional investor receives a fixed amount of ETF shares, some or all of which may then be sold on a stock exchange. Individual investors can buy and sell the ETF shares only when they are listed on an exchange. The number of shares is fixed and they are traded at prices determined by the market (intraday trading). As in the case of index funds, management fees for ETFs are lower than actively traded funds (Gastineau, 2010).

The existence of passive funds presupposes the listing of stock market indices linked to the water market. Among these, for example, we can include the Nasdaq Veles California Water Index, and the S&P Global Water Index, two indexes calculated in a very different way. The first, launched in 2018, records changes in the price of water in five major regions of California. In particular, it tracks the volume-weighted average transaction prices in the five water markets. It currently sets a weekly price for water rights, most of which are managed by the districts who then supply it to farmers. The price is set for one acre (4,000 square meters), equivalent to 1,233 million liters. However, the S&P Global Water Index provides liquid and tradable exposure to fifty companies from around the world that are involved in water-related businesses. To create diversified exposure across the global water market, the constituents are equally distributed between two clusters of water-related businesses: water utilities and infrastructure, and water equipment and materials.

Related to indexes are also futures in water, the main news in the field of financial investments in the water sector. Future is a type of derivative contract with which the counterparties undertake to exchange specific assets (for example a commodity, a financial asset, a market variable, or an index) in the future at a predetermined price. Current futures in water are structured in the form of stock index futures. This is a standardized derivative instrument, traded on regulated markets, through which the buyer and seller undertake to trade in the future a certain quantity of underlying equity indices, at a preset price (Hull, 2015).

Futures have a market quotation. Trading with them, it will be possible to negotiate the value of irrigation water, but also of drinking water. The first future in water was established in California, the largest and most important agricultural market in the U.S., where investors and farmers are interested in locking in prices of water before scarcity sends prices up. This future has the Nasdaq Veles California Water Index as the underlying index. Each contract represents 10 acres of water, and it is always financially settled.

The spread of these contracts also outside the American market could bring benefits to the water sector. By regulating transactions, futures represent transparent contracts capable of aligning the supply and demand of this vital resource. They can also be used to help local administrations, farms and industries protect themselves from risks related to water shortages. They could also become a benchmark, which is a useful parameter for identifying some warning signs.

This derivative is a symmetrical instrument, as both parties are obliged to perform the exchange at maturity. The person who buys the future takes a long position: he must buy the index at maturity. The person who sells the future takes a short position and commits to sell the index at maturity. In most cases, stock index futures do not expire, as traders prefer to close open positions by reselling the previously purchased futures contract at the market quotation. The increase in water prices can then produce returns for a party of the contract.

This can produce potential risks of high volatility and search for gains from water disasters and water crises, instead of against them. Consequently, investments in the water sectors through futures can produce a potential threat of financial speculation. The value of water increases as its availability decreases.

Attempts to solve the water problem also involve effective regulation of financial exchanges concerning an asset so precious and essential for the life of all of us.

Conclusions

Water scarcity represents one of the main global risk in our future. Therefore, this natural resource is at the core of adaptation and transition strategies of governments and corporations. All expectations on water scarcity and water stress, due to both the demand and the supply side, make it essential to produce specific regulations on this topic at an international level, as well as to invest in the sector to reduce water use and make water distribution more efficient. These investments will not only come from governments and public institutions, but

necessarily also from the private sector. It is likely that relevant capital flows will converge towards the water sector in the coming years.

It is then important to understand the opportunities and the threats of the main financial securities available for investing in this field. Water mutual funds and water Exchange Traded Funds are some examples of financial instruments used for taking a position on this theme. Nevertheless, in this context, it is also necessary to mention financial speculation, which can be pursued for example investing in commodity derivatives, such as futures in water. Specifically, some speculative stance, especially bearish, could find advantages in the crisis of the water sector. For these reasons, attempts to solve the problem of water scarcity and water stress necessarily involve strict regulation of financial markets and an effective supervision on financial institutions. Financial authorities should regulate water securities and water-related companies as assets in which to invest responsibly.

KEY TERMS

Water scarcity, water stress, Sustainable Development Goals, environmentally sustainable economic activity, water mutual fund, water ETF, futures in water.

SUBCHAPTER SUMMARY

Water scarcity is one of the greatest risks to sustainable development and economic progress, globally. Physical shortage and supply-side inefficiencies are usually combined with an increase in the water demand, for agriculture, for industry, as well as for domestic purposes. Besides, water scarcity and water stress are exacerbated by environmental factors related to climate change.

As a consequence, water is at the core of the interests of international organizations and regulators who intend to define sustainable development goals and promote sustainable practices across countries.

Among the Sustainable Development Goals (SDG) set up by the United Nations, Goal No. 6 is related to water preservation and it is aimed to “Ensure availability and sustainable management of water and sanitation for all”.

Nevertheless, current financial resources are inadequate to achieve SDG 6. Other than increasing the role and effectiveness of traditional financial resources, it

could be relevant to increase innovative sources of financing, such as commercial financing involving the private sector. The Subchapter distinguishes private funding from the banking sector and financial markets. Banks should introduce specific risk management tools for evaluating the credit risk arising from loans to a water-related company. Considering the financial investments in the water sector, retail and institutional investors can trade water mutual funds, water Exchange Traded Funds (ETFs), and Futures in water. Investors in the financial markets are not only relevant suppliers of funds able to cover the financial needs of water companies, but can also operate with short-term speculative objectives. In particular conditions, financial speculation could also find advantages linked to water crises and must therefore be suitably regulated.

DISCUSSION QUESTIONS

1. Is water scarcity a global or local concern?
2. According to the European regulation, when can an economic activity be unequivocally regarded as eco-sustainable?
3. Why can financing of the water sector create both opportunities and challenges for the banking industry?
4. What are the main differences between a physical risk and a transition risk?
5. In which way is the introduction of environmental considerations in the credit risk process incentivized by the regulatory Authorities in Europe?

TEACHING METHODS

- lectures,
- workshops,
- open group discussions,
- student presentations,
- gamification.

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2.1.5. Unsustainable trends in the global tourism

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LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- understand the causes for the high growth of global tourism,
- understand the positive impacts of the travel and tourism industry on economies and societies,
- understand the negative consequences of unplanned and unbalanced tourism development for tourist destinations,
- get an insight into the dynamics of global tourism development in the period before the COVID-19 pandemic,
- get to know the triggers of unbalanced global tourism growth,
- understand the concepts of mass tourism and overtourism and their harmful effects,

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- get acquainted with the examples of mass tourism and overtourism at various destinations around the world in the period before the COVID-19 pandemic,
- get an insight into the consequences of the COVID-19 pandemic for the global tourism industry.

Introduction

Increasing disposable income levels, greater availability of leisure time, faster and cheaper travel, more destinations to choose from, and the impact of advanced technology have helped make tourism one of the fastest-growing economic sectors in the twenty-first century. Since it can adapt to technological change, product innovations and new markets, tourism has also become one of the most dynamic industries globally. It has begun to drive the socio-economic development and prosperity of numerous economies. The research (Edgell, 2016) on the growth of global tourism over the past 40 years before the COVID-19 pandemic demonstrates that tourism grew much faster than the world economy in terms of output, export, value-added, capital investment and employment. Global tourism was one of the most significant contributors to the world economy, and as an export activity, it was of critical importance to both developed and developing nations.

Tourism's importance for job creation and promotion of local economic development, culture and products is reflected in several Sustainable Development Goals, particularly Goals 8, 12 and 14, which set forth tourism-specific targets (ILO, 2020). Besides its direct positive economic impacts on the gross domestic product (GDP) and employment, it also brings indirect benefits through supply chain linkages to other sectors. For every direct tourism job, nearly one and a half additional indirect or induced jobs are created (UNWTO, 2020). The development of tourism promotes investment and openness to merchandize trade, as tourism and its related sectors require a wide range of goods and services. Tourism is an economic activity that can support inclusive economic growth by providing a) diverse employment opportunities, b) benefits for urban and regional economies, c) opportunities for innovative small-scale business operations, d) support for the promotion of cultural authenticity and natural assets, and e) support for infrastructure-related development and maintenance (OECD, 2020).

Non-economic benefits of tourism include stimulating cultural exchanges, providing a better understanding of the local history, heritage and culture, broadening the visitors' knowledge about a destination's natural environment, etc. Tourism leads to intercultural interaction; tourists often engage and learn from the locals, and locals can increase their pride while hosting tourists. Tourism can lead to creating more social venues and experiences where locals and tourists can interact. Entertainment and recreational facilities can allow for more opportunity to socialize and engage with each other (Deery, Jago, & Fredline, 2012). Herewith tourism can positively contribute to changes in value systems, individual behavior, lifestyles, etc. As part of global tourism, international tourism could be a significant vehicle for fulfilling people's aspirations for a higher quality of life.

Apart from the benefits, global tourism growth has caused enormous economic, social, and environmental costs in the last decades. For many countries, tourism growth brought into question sustainability, often because of rapid and unplanned growth in visitor numbers. The term and idea of sustainability were transferred to tourism from the ideology of sustainable development (WCED, 1987), defined as a process that meets present generations' needs without endangering future ones' ability to meet their own needs. Sustainability rests on three integrated elements: ecological, socio-cultural, and economical. In addition, there are three fundamental principles: futurity, equity, and holism (Redcliffe & Woodgate, 1997). Futurity refers to future generations' needs, equity stands for fair and equal opportunities of different generations, and the holistic aspect implies that development should be considered within broad contexts – not only on a local one.

Concerns of governments, regional and local authorities for preserving and managing the natural and built environments become the most crucial strategy for future growth and tourism development. If international tourism is not properly planned, implemented, and managed well, there is a risk of destroying the natural environment and the built environment. Besides, the tourists are increasingly expressing a desire for a clean environment, tourism experiences in nature, adventure travel activities, and tourism products that include culture, heritage, and history. Therefore, the concept of sustainable tourism development that has entered governments' and tourism authorities' decision-making processes significantly changes the view upon the appropriate global tourism development paradigm.

Global travel and tourism

Key terms and definitions

Tourism is defined as the business of attracting tourists to the host destination through accommodation, entertainment, and tour offers (Revfine, n.d.-a). It is the act of travelling to another environment, for at least 24 hours, but for no longer than one year, for purposes related to business or leisure. According to UNWTO (n.d.-a), tourism is a social, cultural, and economic phenomenon that entails people's movement to countries or places outside their usual environment for personal or business/professional purposes. Goeldner and Ritchie (2011, p. 5) define tourism as "the processes, activities, and outcomes arising from the relationships and interactions among tourists, tourism suppliers, host governments, host communities, and surrounding environments that are involved in the attracting and hosting of visitors". Therefore, tourism refers to the activity of visitors. The visitor is defined as a tourist if his/her trip includes an overnight stay (UNWTO, n.d.-a).

Travel refers to the act of moving from one location to another and can refer to long-distance travel, short-distance travel, overseas travel, domestic travel, both round trips and one-way journeys. It covers a wide variety of different travel purposes and refers to the activity of travelers. A traveler is someone who moves between different geographic locations for any purpose and any duration. The visitor is a particular type of traveller, and consequently, tourism is a subset of travel (UNWTO, n.d.-a).

The tourism industry is composed of businesses that provide various products, services and facilities associated with tourists. However, the travel industry refers to the numerous aspects of the broader service industry that cater to the needs and desires of those who have travelled from one location to another. Many of the businesses and services that cater to tourists also cater to travelers more generally. Herewith, there is clearly a significant overlap between the tourism industry and the travel industry (Revfine, n.d.-b). Nevertheless, there are some notable differences. Essentially, the tourism industry is concerned with people travelling for business or pleasure purposes, staying in their destination for at least one night, and then returning. By contrast, the travel industry has a broader scope, covering more travel purposes (apart from tourism) and durations (less than one night or never returning) (Revfine, n.d.-b).

The travel and tourism industry is divided into five different areas: transportation (airline industry, car rental, water transport, coach services, railway), accommodation (hotels, shared accommodation, hostels, camping, bed & breakfast, cruises, farmhouse accommodation), food and beverage (restaurants, caterings, bars & cafés), recreation and entertainment (sport events providers, museums, galleries, tourist information service providers, shopping centers, amusement parks, casinos, etc.) and related industries (travel agents, tours operators, travel agencies, financial services providers, tourism organizations, etc.). All of these sectors contribute to global tourism.

Key data in the pre-COVID-19 pandemic period

In 2019 the travel and tourism industry accounted for some 330 million jobs worldwide, equivalent to 10.3% of total global employment and one in 10 jobs globally (UNWTTTC, 2019). On average, tourism contributed directly 3% of GDP in G20² economies, 6% of G20 total exports and 6% of G20 employment (UNWTO, 2020). In these years, tourism has become a growing export sector for least developed countries (LDCs), representing 7% of exports in goods and services (10% for non-oil LDC exporters) (UNWTO, ITC, & EIF, 2017). International tourist arrivals in LDCs grew at 9.7% between 2000 and 2019, against 4.8% worldwide (UNWTO, 2020). In Africa, for example, tourism exports, on average, represented 10% of all exports in 2019. In small island development states (SIDS), tourism made an even-larger economic contribution. The sector accounted for over 30% of total exports in most SIDS and up to 80% in some of these countries.

In 2019 the global travel and tourism industry's GDP growth rate outpaced the overall global economy's GDP growth rate for the ninth consecutive year (UNWTTTC, 2020). With 3.5% GDP growth, the travel and tourism industry was in third place after the information and communication sector (4.8%) and financial services sector (3.7%) (UNWTTTC, 2020). Its highest GDP growth rates were evidenced in Asian regions and the Middle East. In 2019 the impacts of tourism at the global level were enormous: 10.3% share in global GDP, 1 in 10 jobs around the world, 6.8% share of total global exports, 28.3% share of global services exports and 4.3% share of total investment (UNWTO, 2020). Concerning Europe, in 2019, the contribution of tourism to the European GDP amounted

² EU and 19 countries that create together 85% of world GDP, 80% of trade and two thirds of world population.

to 9.1%, which was its fifth-largest contribution at the regional level, after the Caribbean, South-East Asia, Oceania and North-East Asia. Tourism GDP growth in other European countries amounted to 3.9% in the European Union, however, 2.2% (UNWTO, 2020).

Trends in Global Tourism in the pre-COVID-19 Pandemic Period

Triggers of unbalanced global tourism growth

The unbalanced growth of global tourism³ before the COVID-19 pandemic was triggered by budget-friendly package tours, cheap flights, cruises, all-inclusive resorts, and a tourism sharing economy. From a marketing perspective, such a growth of global tourism was triggered by social media and the film industry. All these triggers allowed vast numbers of travellers to descend on given destinations in a relatively short time, usually during peak seasons, which caused numerous negative externalities. Several economic, social and environmental factors of a particular tourist destination then led to eponymous impacts.

Economic impacts of unbalanced tourism growth occurred from an over-dependence on tourism income, with destinations experiencing high seasonality levels, particularly vulnerable and exposed to economic stress in off-peak periods. High levels of seasonality also led to employment pressures in other sectors in peak periods. The exponential growth in accommodation web platforms in many cities contributed to a disruption of the local real estate market. Impacts included inflated real-estate prices, unfair competition for licenced accommodation providers, and gentrification of tourism hotspots and inner-city areas, sometimes to the point of pushing locals out of the area (Epler Wood, 2017). The invisible economic burden comprized the unaccounted costs of providing local infrastructure and protecting environmental and socio-cultural systems to benefit both tourists and locals. Huge infrastructure costs were related to the assurance of transport, food, accommodation, energy and water, and the management of the waste produced by tourists and those employed in the tourism sector

Socio-cultural impacts of unbalanced tourism growth, associated with increased demand and tourist visits, were shown in the impediment of local residents'

³ Steady growth in visitors' numbers over time, significant peaks relating to seasonality, or short-term shocks, such as the visit of a large cruise ship or the hosting of large-scale events.

day-to-day activities due to overcrowding and congestion at attractions, in public spaces, and on public transport. Growth in visitor numbers beyond the natural carrying capacity of destinations added pressure on existing infrastructure and services, thus negatively impacting locals and visitors' experience. In urban areas, the spread of tourists beyond traditional tourism "zones" into residential neighbourhoods led to the alienation of local communities due to tourists' inappropriate behavior, increased noise pollution, pedestrian and vehicular traffic, and community-specific infrastructure and facilities degradation (Epler Wood, 2017). Other impacts associated with increased visitor flows included a loss of authenticity and cultural identity/heritage, for example, an increase in hospitality, cultural and retail services for visitors, competing with and displacing resident-oriented services and facilities. Additionally, the process of adapting and adjusting meet the needs, attitudes and values of tourists led to the modification of events, activities or cultural sites and the loss or weakening of local cultural traditions and values (cf. subsection Examples of mass tourism and overtourism below).

Environmental impacts of unbalanced tourism growth caused high congestion levels that led to the deterioration of tourism-related infrastructure, facilities, and local flora and fauna, and exceeded the capacity of support services to cope with demand, such as transport infrastructure, water and waste management. Visitor overcrowding created pressures on resources, such as sensitive natural and historical sites. Other impacts included increased air, light and noise pollution and greenhouse gas emissions associated with the transport of tourists and supplies to/from/around destinations.

The magnitude and combination of economic, socio-cultural, and environmental negative impacts associated with increased visitor numbers varied depending on individual destinations' unique characteristics and variety of other factors. These include the spatial and temporal distribution of visitors, the type and length of visitor stays, sensitive sites' ability to cope with visitor volumes, and the ability or willingness of affected communities to adapt over time (Gonzalez, Coromina, & Galí, 2018; Mahdawi, 2019). Each had a role in determining tourism's impact on a destination, with the most vulnerable coastal and mountain areas, islands, and cultural heritage sites.

Negative impacts of mass tourism and overtourism

The Green Economy Report (UN Environment Programme [UNEP], 2011) set out the first framework for quantifying global tourism's impacts. The report found that tourism has: 1) energy-intensive transportation with growing green-

house gas emissions, 2) excessive water consumption, 3) discharge of untreated water and sewage, 4) generation of solid waste well beyond the capacity of local economies to manage, 5) growing damage to marine and terrestrial biodiversity, and 6) growing impacts on the survival of local cultures, built heritage, and traditions (UNEP, 2016).

Mass tourism is an outcome of growth and geographic concentration of tourism demand and supply. It manifests in its too high numbers and too-high negative impacts on the environment (Mihalic, 2020). On the demand side, mass tourism results in the destruction of destinations' environments. On the supply side, however, it fails to mitigate and manage its negative environmental impacts sufficiently. It destructs flora and fauna and the whole natural ecosystems due to deforestation, soil exploitation, pollution and no existing policy of raising awareness and protecting natural environments, increases the amount of (undifferentiated) waste and causes escape and malaise of local residents. It is considered as a shallow and exploitative form of tourism, consuming vast amounts of resources while giving little back to the local community. Many of created jobs in peak tourist seasons are not given to locals. Much of the revenue is kept by outside investors, and the overwhelming tourist crowds often keep locals from enjoying the infrastructure benefits in their towns and villages.

A few years ago, along with the rapid tourism industry growth, increased numbers of anti-tourists' campaigns and protests, the term mass tourism had been more and more replaced with the term overtourism. It is defined as "the impact of tourism on a destination, or parts thereof, that excessively influences the perceived quality of life of citizens and/or quality of visitors experiences in a negative way" (Ali, 2016). Overtourism refers to overcrowding, congestion and overuse of local infrastructure, the privatization of public places, the loss of purchasing power, high tourist to resident ratios, commercial gentrification and antisocial behavior (Koens, Postma, & Papp, 2018; Peeters et al., 2018). According to Dickinson (2018), overtourism can be defined as: "The phenomenon of a popular destination or sight becoming overrun with tourists in an unsustainable way". UNWTO defines it with socio-psychological dimension as the negative impact on citizens' perceived quality of life and/or quality of visitors' experiences (UNWTO, 2018, 2019). The European Parliament's TRAN Committee (TRAN Committee, 2018) adds the socio-political dimension. It defines overtourism as "the situation in which the impact of tourism exceeds physical, ecological, social, economic, psychological and political capacity thresholds".

Large anti-tourism campaigns that have been recorded in many destinations which were historically accepting lots of tourists, including France, Spain, Italy and Germany, started about seven years ago. The most recent ones that began in 2017 in the metropolis and significant tourist destinations raised awareness against crowding at individual tourist sites and triggered a global debate on the desirability of further rapid tourism growth. New protests involved much more extensive and broader communities, associations and activist groups than those from the end of the previous century (Mihalic, 2020). The researchers started an intense debate about causes, consequences, possible management solutions and policy responses to the phenomenon of “overtourism” (e.g., Butler, 2019; Gretzel, 2019; Milano, Novelli, & Cheer, 2019; Zerva, Palou, Blasco, & Benito Donaire, 2019). The research highlighted the complexities of tourist pressure in the context of “crowding”. It has shown that crowding leads to changes in the perception of the liveability, desirability and economic viability of a place/destination (e.g., Bellini, Go, & Pasquinelli, 2017, cited upon Mihalic, 2020, p. 3).

Another term emerging from the “overtourism” debate is “antitourism”, which can be interpreted and connected with crowding. Hughes (2018) connects anti-tourism with the negative impacts of mass tourism and destination mobilization using the motto “Tourists go home”. “Aversion to tourism” or tourism “rejection” is a result of the negative effects of tourism development (Martin, Martinez, & Fernandez, 2018). From the perspective of local residents, antitourism starts after visitor carrying capacity⁴ is reached, and perceptions of quality of life begin to decline. Residents’ contentment with the growth of tourism in terms of visitation and impacts turns into dissatisfaction and irritation, resulting in their opposition to tourism development or tourists’ presence (Navarro Jurado, Romero-Padilla, Romero-Martínez, Serrano-Muñoz, Habegger, & Mora-Esteban, 2019, cited upon Mihalic, 2020). In such circumstances, overtourism is expressed by mobilized or organized movements of irritated destination residents acting against tourism development.

Similarly, the new meaning of antitourism or antivisitation can also be applied from the visitor perspective. It starts after the visitors’ carrying capacity limit has been reached. Overall visitor satisfaction with the destination turns into dissatisfaction, and visitors react by leaving and avoiding the destination in the future. Overtourism and antitourism give ground to sustainability’s socio-political dimension, giving more attention to the sustainability paradigm (Mihalic, 2020).

⁴ Socio-psychological perception of local residents about the maximum levels of tourism and its (negative) impacts that local residents are willing to accept.

Some researchers employ the term “tourism phobia” (e.g., Koens et al., 2018). The term describes forms in which antitourism manifests in organized movements and pressures. One instance is discrimination expressed against visitors, as epitomized by the slogans “tourists you are terrorists” and “no tourists allowed” observed in Barcelona (Martins, 2018).

Examples of mass tourism and overtourism

To better understand the harmful impacts of mass tourism and overtourism, we summarize them on the examples of different destinations worldwide (Condé Nast Traveler, 2018; Framba, 2021; Green Global Travel, 2018).

Africa

In the years before the COVID-19 pandemic, tourists in Cairo in Egypt congested the roads around the precious historical cultural heritage in Giza, attracting exploitative cottage industries, touts, papyrus factory tours, and camel rides. Such tourism caused income imbalances in the city and increased the dangers of unrest and revolt of some groups of inhabitants. Finally, due to the overblown safety warnings and fears, the number of tourist visitors has fallen significantly, and the local economy crashed. Such a lesson offered Cairo the chance to embrace responsible tourism, including visitors’ limitations, and encourage tourists to explore the whole area’s ancient history and culture, not just a few tourist hotspots.

Due to the enormous growth of Marrakech tourism in Morocco, the number of Marrakech residents almost doubled in a little more than ten years before the COVID-19 pandemic. Such a large number of residents who saw the income opportunities in many tourists put pressure on resources and infrastructure. The costs of essential goods and rents rose, while the salaries remained relatively stagnant. Residents needed to earn much more money to maintain even a basic standard of life. Besides, because tourists increasingly outnumbered the residents, it was not easy to experience the traditional life and culture of Marrakech.

High numbers of tourists at Mauritius, which is already one of the most densely inhabited islands globally, left various negative impacts, particularly for nature. In the southern part of Mauritius, where the last pocket of extended forest remains in the Black Forest National Park, minimal natural habitat is left for local wildlife. Unfortunately, this was one of the island’s most heavily promoted regions for day trips, with huge numbers of tourists visiting every day.

Cape Town is one of southern Africa's favorite holiday hotspots. One of the significant overtourism downfalls in Cape Town was a large increase in real-estate prices, which has created a more significant divide between rich and poor. Tourists arrived and started to buy relatively cheap properties. Their activity increased the prices and made it almost impossible for locals to afford homes. Even worse were the overseas investors who bought a property just to rent it on web accommodation platforms. Other negative effects of tourism include horrendous traffic, an increase in thefts, and the rise of begging individuals all over the town.

Asia

When visitors made the journey to Agra in India, besides the Taj Mahal's sublime beauty, they were faced with the overwhelming crowds and the degradation and disorder of Agra. The lack of marketing innovation by the Indian tourism industry resulted in most tourists heading straight for the "Golden Triangle" of Delhi, Agra, and Jaipur. Tourism authorities did not recognize the numerous natural beauties and other attractions worth seeing and experiencing in India, far away from the crowds, touts, and other overtourism development path aggravations.

In the years before the COVID-19 pandemic, Bagan's famous Valley of Temples in Myanmar was suffering from many tourists. Apart from earthquakes and natural erosion, disrespectful tourists contributed to the significant reduction of the number of pagodas that once stood there. One of the most common activities in Bagan was to climb the pagodas at sunrise to watch the hot air balloons glide across the sky and again in the evening to see the sunset. However, the majority of tourists flocked to the five most popular pagodas, where climbing was allowed. Additionally, some of them were not satisfied with the pagodas' platform areas' views and climbed up to the tip of the pagodas, which often crumbled. Such tourists' behavior represented an insult to the site's historical importance and endangered their lives.

Bali in Indonesia used to be a peaceful place where travelers would escape the stress of their everyday life. They could enjoy lush nature, bask in the Sun on beautifully pristine beaches, and surf big waves. Most visitors would spend their time immersing themselves in the ancient traditions and rituals of the local people. Due to mass tourism, Bali became mayhem. The island has been filled with large chain hotels and shopping malls. Denpasar, Bali's capital, was completely congested with traffic and pollution. What used to be a tropical paradise was

being ruined by overtourism. Most of the beaches were incredibly crowded. The lack of proper garbage disposal and recycling initiatives caused places such as Kuta Beach to be enormous dumps.

El Nido, Palawan in the Philippines, was known as a haven for adventurers looking to experience untouched nature and quiet turquoise waters. However, the overtourism in the years before COVID-19 caused many problems. There was not enough local food for all tourists due to the mass conversion of farmland into resort construction sites. There was no wastewater management system, meaning sewage from these newly constructed hotels went straight into the turquoise ocean. As the main attraction in El Nido's archipelago, idyllic lagoons became swamped with sunbathers since every travel agency in town basically sold the same day tour. In 2017 the daily visitor limits were introduced; however, tour operators simply shifted crowds to other islands (similarly to El Nido happened with Boracay) without unmanaged overall visitor numbers.

As the UNESCO World Heritage Site, Halong Bay is the most famous site in Vietnam. Before the COVID-10 pandemic, it was also the most visited, with nearly three million tourists cruising its waters every year. Overtourism in Halong Bay has resulted in both environmental issues and several accidents. The influx of visitors, coupled with a lack of safety regulations, has created a saturated market with irresponsible tour operators more concerned with profits than environmental and safety issues. In Halong Bay, the negative effects of poorly managed tourism on a destination were clearly apparent.

Millions of people saw the movie "The Beach" from 2000, starring Leonardo di Caprio, and it seemed like most of them ended up travelling to Maya Bay Beach on Koh Phi Phi, Thailand, where most of the movie was shot. After such mass tourism, the place was no more a paradise. It was full of boats and numerous of tourists, often rowdy and drunk.

Perhentian Islands in Malaysia were a tropical paradise once, with their white sand beaches and crystal-clear sea. Due to the overtourism, their charm of paradise was lost. Every day the weird brown patches were floating in the ocean, and everyone wanted to avoid them. What was once an occasional speedboat taxi evolved into multiple boats at sea. To make matters worse, they were driven by teens racing each other, turning a leisurely swim into a disturbing nightmare. Instead of keeping the natural balance, local tourism authorities seemed to aspire only to tourism growth.

Central America

From Playa del Carmen to Cancun, the uncontrolled surge of tourism at the Yucatan Peninsula in Mexico turned much of the region into one massive all-inclusive resort. What once was a series of pristine jungle and marine ecosystems was gradually being destroyed by chaotic urbanization. Nearly 10 million visitors a year descended upon the Mexican state, including the Yucatan coast, and suffocated the ecosystems with plastic bottles and organic waste. Most locals did not profit from this rapid rise of tourism revenue since all-inclusive resorts rarely hired indigenous natives, and these resorts rarely gave back to the community. Once a quiet fishing village, Playa Del Carmen lost all local appeal. It became a throbbing beach town dominated by a tourist strip filled with splashy resorts, booming nightclubs, and drugs. Violence and theft surged in the surrounding communities.

Europe

The combination of drug-focused tourism and cheap budget flights turned Amsterdam's Centre district into a crowded mass tourism place. The rise in tourism made it very difficult for local residents in the Centre to find shops to do their everyday errands. Mass tourism finally reached a point in 2017 where overtourism was so bad that the government banned new tourist-oriented shops from opening in the Centre. They also started to regulate web accommodation platforms much more strictly, as Amsterdam's property market crisis reached full bloom. One of the local government's advice to the Amsterdam visitors was to consider staying outside of the city's Centre and not using web accommodation platforms.

The stunning Gaudi architecture, a rich culinary and the Olympics in 1992 that improved local quality of life put Barcelona on the map for international tourism, which grew to 32 million visitors in 2016. Many of these visitors were day-trippers, coming into the city on cruise ships carrying up to 5,000 passengers. Barceloneta, once a charming fisherman's quarter, has become overcrowded. Hiring apartments via real estate sharing companies forced out locals, as renting out apartments to tourists was much more lucrative for owners than having long-term tenants. Consequently, the real-estate prices raised in a few years by up to 20%. Some local shops around the Ramblas – some of them over 100 years old – were being replaced by souvenir shops that could afford businesses' rising rental prices. This gentrification diminished the area's authenticity.

Due to the overtourism, the narrow, historic center streets of Cinque Terre, a small colorful seaside village in Italian Liguria, became a shuffling mass of tourists who treated local homes as if they were museums, walking in and posing for photos, etc. These tourists spend little or no money. However, tons of rubbish needed to be removed daily, and locals could not enjoy the village due to the multitudes of rude, rowdy people crowding them all summer.

The Alpine lake Bled in Slovenia is considered as the epitome of picture-perfect and millions of tourists have photographed the vista with the island and the little church perched on top. The number of tourist nights in Bled almost trebled between 1994 and 2016. Due to uncontrolled tourism before the COVID-19 pandemic, lake ecology deteriorated, primarily due to the surge in swimming, fishing and boating, and the lake shoreline's rapid development. Traffic on and around the lake surged, and there were more and more swimmers and fishermen. Feeding of fishes in the lake amounted to over ten tons of nutrients being introduced to the lake each year. This drove up phosphorous levels and supported the development of dangerous cyanobacteria. Infrastructure, including sewage, has not been keeping up with the increase in visitors. Local authorities introduced several measures to limit the negative impacts of mass tourism: they reduced the intensity of the lake area's use, banned the feeding of fowl and fish in the lake, set the limits of daily fisherman's carp fodder, scaled back the traffic around the lake and improved the sewage.

Besides the appeal of the citrus-coloured Old Town nestled atop the turquoise sea, Dubrovnik in Croatia also has a fascinating, tumultuous history rooted in its local culture. Mass tourism started to push this town far beyond its carrying capacity. In peak times, Dubrovnik visited around two million people each summer. The Old Town was flooded with tourists and selfie sticks; cars honked at each other in bumper-to-bumper traffic; the local buses were full of tourists. Living expenses were increasing due to tourism, and many locals were struggling. Local authorities made efforts to extend the tourist season beyond the summer and to limit cruise ships.

Santorini became one of the most iconic places to visit in Greece, primarily due to its whitewashed villages, blue-domed churches, and incredible sunsets. But many of the locals who once lived in this Mediterranean paradise have been driven out due to rising property costs. The price for Greeks to ferry to work from neighboring islands was prohibitively high. The locals who were left were invaded by disrespectful visitors who often destroyed their property while trying to get the perfect selfie. The island's main roads were littered with trash left by indifferent tourists.

Due to a certain aura of magic and mystery about Venice, visitors have been unable to resist the allure of the city's romantic canals, singing gondoliers, picturesque bridges, and grand architecture for decades. Aside from its risk of sinking and its threat from flooding, Venice became endangered due to tourists' overcrowding. Mass tourism, attributed to the mega-cruise ships, caused damage to the fragile lagoon ecosystem and the city. A city that only inhabited under 55,000 residents yet welcomed over 30 million visitors a year. Venice and its Lagoon have long been listed as a UNESCO World Heritage Site. But due to mass tourism, not only there was a risk of losing its status, it faced entering the "Endangered" list, a list customarily reserved for ruins and sites damaged by war. Vandalism, crime, destruction of historical sites and tourists' behavior caused tensions between residents and visitors. Local necessity shops have been closed to be replaced with souvenir stalls, further pushing locals out of their city.

North America

Banff, one of the most frequently visited destinations in Canada, located in the Canadian Rockies, is home to several of Canada's most famous ski resorts. Tourism there created a unique set of social problems caused primarily by the fact that, as a town located inside a National Park, Banff had strict boundaries. Therefore, it wasn't able to expand beyond the 4.9 square kilometers allotted to it. The destination's extreme popularity and the limits on expansion meant that the town's limited real estate was costly and almost entirely devoted to high-end tourism. The service industry workers couldn't afford the few apartments available and were forced to live in small dormitories provided by their employers. Seasonal hiring/firing created a transient community of locals. The result was a very unusual society of short-term locals and a nearly ubiquitous binge-drinking party culture. Overtourism turned Banff from an attractive ski destination into a churn-and-burn business focused only on pleasing tourists rather than providing an affordable quality of life for locals.

Manhattan is the most-visited part of New York City, the USA's top port of entry, top generator of tourism revenue, and top big-city destination. Tens of millions of people visited it every year. Therefore, parts of Manhattan had hit their carrying capacity. Places like Times Square and Rockefeller Center during heavy travel periods were not pleasant to visit anymore, whether for tourists or locals. There were vital questions about the degree to which the money tourists spent in Manhattan added to the local economy.

Maui in Hawaii topped “Best Island in the World” ratings for years due to the perfect weather, beaches, and picturesque views. But all this perfection came at a cost, which was the degradation of a once-perfect vacation destination, a land of aloha. At just 727 square miles, Maui is a small island, yet it saw around 3 million tourists each year. Those visitors drove up local prices, crowded the popular areas, and made it harder to relax. There was also the negative environmental impact of tourism, with several endemic species needed additional protection. A tiny, fingernail-shaped atoll next to Maui’s coast was a popular spot for snorkelling on Molokini. However, in the years before the COVID-19 pandemic, there were so many packed catamarans in the top tourist season that the snorkelling area was full of swimmers. Such snorkelling did not bring fun anymore, and flora and fauna of that area were endangered.

The USA’s Yellowstone National Park’s tourism increased by more than 40% in ten years before the COVID-19 pandemic. This dramatic increase caused numerous problems. The first was visitors walking off marked trails, causing environmental damage by destructing the vegetation, which led to erosion issues. The second problem was the irresponsibility of visitors who threw coins and food into the geothermal features, which harmed the geothermal algae. Some visitors even walked in the geothermal features, which could lead to death. Another big issue was human/wildlife encounters that caused risks. Poorly informed visitors would involve themselves in an “animal rescue” rather than letting nature take its course.

South America

One particular destination that suffered from overtourism in South America in the pre-COVID-19 times was Machu Picchu and the increasingly popular Inca Trail that leads to it. This was obvious in terms of countless irresponsible travellers ruining the natural beauty and mystical appeal with their ubiquitous selfie sticks. But the worse thing was the area’s sanitation issue. There was toilet paper lining the hiking trails, squat toilets overflowing, etc. One of the first restriction of the Peruvian government to visitors in 2017 was a limitation of entering only with an official tour guide in groups up to 15 visitors or less. Additionally, entry granted only a morning visit or an afternoon visit. While inside, visitors need to stay on marked paths. However, the harmful impacts of mass tourism on the natural environment could not be overlooked.

The roles of governments and local tourism authorities

Some tourism researchers see overtourism as one “symptom of the problem” related to the growth-led neoliberal capitalism tourism business model (e.g., Fletcher, Murray Mas, Blanco-Romero, & Blazquez-Salom, 2019; cited upon Mihalic, 2020). They suggest focusing on degrowth and placing local communities’ rights above tourists’ rights and tourism businesses’ rights to make profits. Given that many residents also directly or indirectly receive or are aware of financial and other tourism benefits for the destinations, governments’ consensus on degrowth and proper action was not easy. UNWTO study (2018) on overtourism found that the majority of residents in eight “overcrowded” European cities believed “there should be no limitations to the growth of visitors”.

Failure of national and local governments to adequately address the impacts of rising tourism numbers can lead to concerns over the value or worth of tourism for destinations and even resentment towards visitors. It also has the potential to negatively impact long-term destination competitiveness, meaning that some destinations could become victims of their success (OECD, 2020). Therefore, there is a growing argument that tourism benefits should not be measured only in visitor numbers (by demand), but rather 1) in its ability to contribute to local economies and 2) in the extent of net benefits it provides to destinations – in its effectiveness in providing livelihoods, contributing to the local economy, and in its net benefits to destinations, communities and indigenous people (Goodwin, 2016). Several metropolia have started to promote new governance approaches by integrating urbanism, housing, and mobility measures into their tourism strategies (cf. Policy report for 11 European metropolies (Eco-Union, 2018)).

In line with this argument, numerous destinations strive to achieve more sustainable tourism growth, i.e. growth that addresses visitors’ needs, tourism industry, host communities and the environment. Such growth requires all relevant stakeholders’ informed participation and strong political leadership to ensure broad participation and consensus-building. According to the definition of sustainable tourism by the UN Environment Programme and UNWTO, sustainable tourism “takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities” (UNEP & WTO, 2005). Achieving sustainable tourism growth is an ongoing process that requires continuous monitoring of impacts to capitalize on opportunities and respond to challenges (OECD, 2020).

The COVID-19 pandemic and global tourism

Impacts

Unexpected events or shocks, like a change of the weather, outbreaks of diseases, or terrorist attacks, could disproportionately affect destinations that highly depend on tourism revenues. The tourism industry in pre-COVID-19 times represented a significant source of economic and social development in the world. Its contribution was significant for both developed and developing countries but significant for those LDCs that are highly dependent on it. The pandemic COVID-19 has severely affected tourism in all countries. Over the first five months of 2020, the G20 economies lost 55% of their international tourist arrivals (UNWTO, 2020). However, the impacts are most pronounced in LDCs and SIDS. These countries were even more severely hit due to (1) the share of tourism in their economies in terms of both GDP and exports, (2) their reliance on the sector for employment, (3) fragile economies, and (4) insufficient government support for financial packages and social protection. The pandemic and global efforts to contain it could cause the international tourism economy to contract between 45 and 70% (OECD, 2020).

Because of tourism's supply linkages in goods and services and its strong multiplier effect, the COVID-19 pandemic threatens socio-economic development in both developed and developing nations. Owing to supply chain linkages, the negative impacts of COVID-19 on the economy can be as much as three times the loss of tourism receipts. Unemployment in some countries could rise by more than 20 percentage points (UNCTAD, 2020). The pandemic limited the global movement of people and goods, isolating many countries and regions. As a result, the aviation industry faces the most profound crisis in its history (ICAO, 2020), with around 90% of the fleet being grounded and demand close to zero during the second quarter of 2020. The impact of the COVID-19 pandemic on the maritime transport of passengers has also been tremendous, particularly as individual countries have advised against travel by ship, and major cruise companies have suspended operations.

The impact of the COVID-19 pandemic on tourism places pressure on heritage conservation in the cultural sector due to revenue loss. Many intangible cultural heritage practices such as traditional festivals and gatherings have been halted, with significant consequences for the social and cultural lives of communities everywhere. Cultural World Heritage sites and museums, also highly rely on tourism revenues to carry out instrumental monitoring, conservation and archae-

ological work. The reduction in visitors has had a direct negative impact on these operational budgets. 90% of countries closed their World Heritage sites in response to the pandemic, with immense socio-economic impacts on the communities that depend on tourism revenues. Likewise, 90% of museums were closed during the pandemic, and many of them may never reopen (UNESCO, 2020).

The impacts of COVID-19 on tourism threaten to increase poverty, inequality and reverse nature and cultural conservation efforts. For various marginalized groups of populations, tourism has been a vehicle for integration, empowerment and income. It has supported economic growth of rural areas, provided access to training and jobs, and often transformed the value that communities and societies ascribe to their cultural and natural heritage. The shutdown of tourism activities has meant months of no income for many protected areas and the communities living around them, many highly dependent on tourism for survival and with no access to social safety nets. The loss of tourism income further endangered protected and other conserved areas for biodiversity, where most wildlife tourism took place. Without alternative opportunities, communities may turn to the over-exploitation of natural resources, either for their own consumption or to generate income.

The pre-COVID-19 global tourism development and growth caused a high climate and environmental footprint, requiring heavy energy and fuel consumption and placing stress on land systems. Despite a significant drop in air pollution and water pollution due to the considerable decline in global travel in the period of the pandemic, the latter has also provided cover for illegal activities, such as deforestation of the Amazon rainforest and poaching in Africa, hindered environmental diplomacy efforts, and created economic fallout that some predict will slow investment in green energy technologies (cf. Deliso, 2020; Newburger, 2020a, 2020b; Simon & Castano El Hammar, 2020).

Prospects

Countries and international organizations have implemented a range of measures to mitigate the socio-economic impacts of the COVID-19 pandemic and to stimulate the recovery of tourism (cf. e.g., ILO, 2020). However, the recovery will take time and depend on the duration and magnitude of the outbreak waves and the effectiveness of containment measures, consumer confidence levels, and economic conditions, with the long-term effects not yet fully apparent. Meanwhile, in such an uncertain situation, the tourists are suggested to follow the UNWTO health advice and travel responsibly (UNWTO, n.d.-b).

Conclusions

Tourism, a sector built on people-to-people interaction, should be one of the primary vehicles for promoting culture and advancing intercultural dialogue and understanding. However, when it exceeds the acceptable scope, it could become a threat. That happened at many destinations around the world before the COVID-19 pandemic. The remarkable growth of global tourism in this period brought various negative externalities. Many tourist destinations were fraught with overcrowding, pollution, overbuilding and other developmental difficulties that could destroy their attractiveness. Overcrowding and congestion of tourism-related infrastructure led to the degradation of natural and historical sites, monuments, landscapes and public spaces. This, in turn, led to a loss of identity and authenticity of destinations, negatively affecting the tourist experience and the environment and the host communities upon which tourism depends (OECD, 2020).

Such growth of global tourism was, among others, triggered by social media and the tourism sharing economy. Social media can accelerate the temporal and geographical concentration of tourism flows, whilst accommodation sharing services can affect neighbors and local residents, as well as local housing markets and traditional accommodation providers. Poorly managed growth of these sharing services may also have a detrimental impact on destinations' historical heritage, leading to gentrification and reducing their appeal and affordability as places to live.

Carrying capacity is an essential metric for determining the upper limits in tourism development, visitor use and the optimal utilization of tourism resources. However, no general guidelines for determining a destination's tourism capacity are identified as each tourism environment has multiple limits (Wall, 2020). Limits depend on place-specific factors such as tourism type, stage of development, environmental and social characteristics, and typical visitor behavior in terms of tourism's flows through time and space (Mihalic, 2020). Also, socio-spatial studies on tourism crowding include personal and behavioral variables of residents that impact their perception of social density or crowding and thus satisfaction with their residential neighbourhoods.

The COVID-19 pandemic has shocked the world. Its challenge of mitigating the harmful effects and recovering economies and societies is almost comparable to the war period. Undoubtedly, it deteriorated the economic and social dimensions of sustainability but improved its environmental dimension. However, its duration and severe requisite economic and social limitations have already brought several problems that could impact the natural environment, particularly in less developed states with low income and weak social nets. The travel and tourism industry has been harmed the most. The lesson for tourist destinations that relied

on unbalanced, short-term tourism policies and ad-hoc approaches towards tourism development is painful. COVID-19 pandemic has brought all tourist agents the awakening about the requisite measures for times of crises. It forced them to think about new types/modes of tourism and new tourism development strategies for the global economy and society's turbulent and unpredictable future. Smarter decisions by governments, tour operators, and responsible tourism non-governmental organizations will help avoid the development paths towards mass and overtourism and set new directions for a more inclusive and less ecologically harmful tourism industry.

SUBCHAPTER SUMMARY

This Subchapter discusses the socio-economic importance of the global travel and tourism industry from its contribution to GDP and employment, according to the statistical data in the period before the COVID-19 pandemic. Apart from the travel and tourism industry's positive impacts, we describe its evidence-based harmful effects when its high-growth development path is unbalanced, thus negatively impacting the quality of local communities' social life, heritage, and natural environment. The presented key data on the travel and tourism industry before the COVID-19 pandemic show this industry's unsustainable development path (at the regional and global levels). We conceptualize mass and overtourism as unsustainable phenomena of rapid and unbalanced travel and tourism growth, triggered by political, economic, technological and social changes and destination's tourism strategies, focused on volume growth instead of optimizing tourism benefits. Negative consequences of high-growth tourism are described in several practical examples of tourist destinations worldwide. The presented statistical data and forecasts show the enormous consequences of the COVID-19 pandemic on the global travel and tourism industry and support the thesis that this industry is one of the major victims of a current global health crisis. COVID-19 pandemic is discussed as good for nothing and a mandatory turning point of new, more sustainable global tourism development directions.

KEY TERMS

Travel industry, tourism industry, unbalanced tourism, mass tourism, overtourism, green economy, sustainable development

DISCUSSION QUESTIONS

1. How did you experience the crowding during the visits to well-known tourist destinations?
2. If you travelled to various continents, what kind of differences did you see in local authorities approaches towards limitations of mass tourism negative consequences?
3. What would be your suggestions for measures to limit the numbers of tourists at well-known tourist destinations?
4. In your opinion, what kind of importance do educational levels of tourists have in their behavior at tourist destinations?
5. Do you think there will be any changes in approaches towards tourism policies and strategies for recovery after COVID-19 compared to the period before 2020?

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2.2. Economic sustainability threats

2.2.1. Unemployment

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LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- define the concepts of unemployment, underemployment and their component definitions for the measurement of the labor force as well as indicators such as unemployment rate, labor force participation rate, unemployment ratios,
- identify highlights of sustainable employment,
- explain cyclical, frictional, structural and long-term unemployment,
- analyze data sets of the Sustainable Development Goal 8 targets and indicators related to employment issues.

Introduction

Sustainable Development Goal (SDG) 8 seeks for full, freely chosen and productive employment and decent work for everyone (United Nations [UN], n.d.). Earnings from work are the main source of income for most people, making its accessibility a primary concern. Yet, as emphasized at the start of this Subchapter, labor is massively underutilized and many workers are unable to access em-

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ployment in the way they want. In 2017 around 113 million Europeans lived in households at risk of poverty where household members faced income poverty or very low work intensity (Eurostat, 2020a). In addition, young people also continue to be the group with the highest risk of unemployment. At the time of writing this book, the world was in pandemic situation due to the COVID-19 virus which António Guterres, the United Nations Secretary-General, has rightly called “[...] the greatest test that we have faced together since the formation of the United Nations” (BBC News, 2020), where millions of people were threatened of losing their jobs and wages.

Against the above background, this Subchapter first addresses the definitional elements of the key concepts of unemployment and underemployment. When referring to unemployment dynamics in period 2005-2020 in a sample of European Union (EU) member states, attention to sustainable employment is given. The Subchapter then goes a step further by explaining types of unemployment, examining some prominent causes, such as minimum wages, unions and efficiency wages. Finally, the Subchapter provides an analysis of indicators related to SDG 8.5 target.

Concepts, definitions and indicators

The unemployment debate often focuses on the economy, trust on governments and benefits. Among researchers and scientists the unemployment rates are considered as indicators of social wellbeing, also as indicators of economic or labor market performance. Statistical figures of unemployment play an important role in the debates between politicians, decision-makers and the society, since they promote the understanding of common labor market problems and the plans and actions undertaken to address them. Yet it is not a surprise that economic conditions like economic crisis have a major influence on labor markets. The literature on unemployment considers many characteristics of the labor market, whereas this section will focus on the dominant player – labor force.

Concepts of the population and the labor force are the starting point because changes in a size of population can significantly influence the labor market. **Population** refers to all the inhabitants of a given country or area (province, city, metropolitan area, etc.) considered together (UN, 2021). While shortly describing the **labor force** (formerly known as economic active population) it is the sum of the number of persons employed and the number of persons unemployed (International Labor Organization [ILO], 2021b). The population is the key

source for the labor force. According to the Pew Research Center's analysis of the United Nations' World Population prospects 2019 report, the world's population is continuing to grow with 7.7 billion people at the end of 2020 and expected to reach 9,7 billion by 2050. However, not everyone is a part of the working-age population. All individuals according to their activities during a specified time period are classified into three categories:

- 1) employed (individuals with jobs),
- 2) unemployed (jobless individuals),
- 3) not in the labor force.

The first two categories make up the current labor force which gives a measure of the number of persons furnishing the supply of labor at a given moment in time. To ensure that each person is classified into one (and only one) of the three basic categories, special rules are set by ILO Resolution I.

ILO Resolution I describes "employed" as all persons above the age specified for measuring the economically active population (e.g., 15 years) who, during a specified short period of either one week or one day, were in the following subcategories:

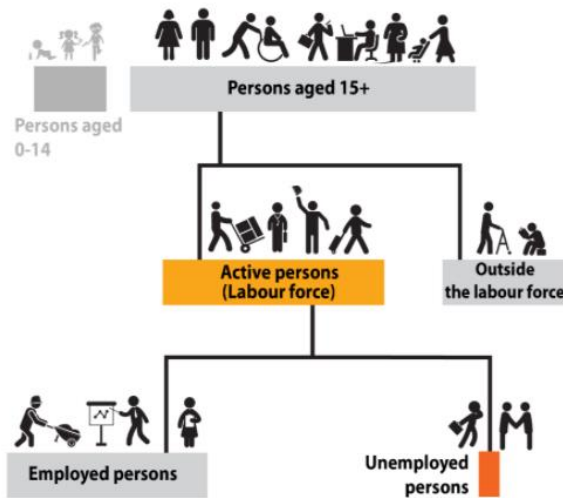
1. Paid employment: (a) at work: persons who, during the reference period, performed some work for the wage or salary, in cash or in kind related income, (b) having a job, but not being at work: persons who, having already worked in their present job, were temporarily not at work during the reference period and had a formal attachment to their job, such as sick leave, parental leave, temporary lay-off, etc.
2. Self-employment: (a) at work: persons who work for pay or profit while on training or skills-enhancement activities, (b) persons who work in their own economic units to produce goods intended mainly for sale, (c) persons who, performed some work for profit to the household or family, in cash or in kind.

For example, Mr X was employed as a travel consultant in the tourism sector office, but did not work for the 6 month due to the COVID-19 restrictions. His employment contract has not been broken and he has been assured by his employer he could return to work as soon as restrictions are removed. Mr X, therefore, keeps an attachment to his job and is thus not recorded as unemployed.

Following the guidelines of ILO Resolution I, unemployed persons are qualified all those of working age who were not in employment, carried out activities to seek employment during a specified recent period and were currently available

to take up employment given a job opportunity. The last two criteria are covered by one or more of the following actions: having been in contact with a public employment service to find work; having been in contact with a private agency to find work; applying to employers directly; asking about the possibility of finding work among friends, relatives or acquaintances; studying, placing or answering job advertisements; taking a recruitment test or examination or going for an interview; or carrying out steps to establish a new business (looking for land or premises, purchasing equipment or applying for a trading/business license or financial resources). As mentioned before pupils of 15+ years old and students may be considered as unemployed and being a part of the labor force if they are searching for a job and are able to work. The Figure 2.21 shows the structure of population participating in labor market.

Figure 2.21. Composition of the population by labor force status



Source: Eurostat (n.d.-a).

The labor force is measured in terms of the **labor force participation rate** which is the number of persons in the labor force as a percentage of the working-age population (ILOSTAT, 2021a):

$$LFPR (\%) = \frac{\text{Labour force}}{\text{Working age population}} \times 100$$

This indicator plays a central role in the study of the factors that determine the size and composition of the country's human resources and in making projections of the future supply of labor. The information is also used to formulate

employment policies, to determine training needs and to calculate the expected working lives of the male and female populations and the rates of accession to, and retirement from economic activity – crucial information for the financial planning of social security systems. The indicator is also useful for understanding the labor market behavior of different segments of the population. The level and pattern of labor force participation depend on employment opportunities and the demand for income, which may differ from one category of persons to another. For example, studies have shown that the labor force participation rates of women vary systematically, at any given age, with their marital status and level of education. There are also important differences in the participation rates of the urban and rural populations, and among different socio-economic groups (ILOSTAT, 2021a).

Here are some concrete figures taken from regional shares of the global labor force in 2019. Following ILO modelled estimates 57% or more than a half of the world's labor force was concentrated in Asia and Pacific region countries. For Europe this number stood at 10.1%; for Africa, Latin America and the Caribbean region at 28.1%.

Comparison of the overall labor force participation rates of countries at different stages of development reveals a U-shaped relationship. In less-developed economies, labor force participation rates can be seen to decline with economic growth. (ILOSTAT, 2021a).

The statistical measurement of unemployment began in the late 19th century and continues until nowadays. Official unemployment is presented in absolute figures, in other words, the total number of people who are unemployed. However, to make comparisons easier between countries, over time and between different groups in society (for example, based on sex, age or education), it is more common for unemployment data to be presented as rates (Eurostat, 2020b).

Unemployment is measured in terms of **unemployment rate** (UR) which represents unemployed persons as percentage of the labor force (ILOSTAT, 2021c):

$$UR (\%) = \frac{Unemployment}{Labour\ force} \times 100$$

With the definitions presented above it is important to keep in mind, that there are a few common misconceptions between unemployment rate and registered unemployment rate. Registered unemployment rate reports the share of persons in the labor force who are registered at employment offices or other competent authorities, which may imply that they are receiving unemployment benefits or

not (depending on the national context), excluding all other jobless persons. The unemployment rate, in contrast, covers all jobless persons who are available and seeking employment, regardless of whether they are registered or not. It is of particular interest to note that in most cases unemployment rate and registered unemployment rate will differ. Following the example described above it may also sometimes be hard to understand the actual meaning of unemployment rates.

Alongside the unemployment rate there is also the unemployment ratio. The **unemployment to population ratio** indicator is measured as the number of people who are unemployed in relation to the population of the same age and calculated as (ILOSTAT, 2021b):

$$UPR (\%) = \frac{\text{Unemployment}}{\text{working age population}} \times 100$$

Unemployment ratios are particularly useful for analyzing developments among younger people, for example, those aged 15-24 years, where it is common for a high proportion to still be within full-time education. Unemployment rates and unemployment ratios are often misinterpreted in the media. Below there is an example of this mistake. “Wasted talent: Greece youth unemployment majority” was the title of an article which appeared in the BBC media beginning with “More than half of the young people in Greece are unemployed”. Unfortunately, this was not true. The annual youth unemployment rate for Greece was 55.3% in 2012; later it rose to 58.3% (2013) and it remained above 50% in 2014 (52.4%). Since then, it has gone down and in 2018, the rate was 39.9%. What does this mean? In simple terms, that more than half of all young people (aged 15-24 years) in the Greek labor force were unemployed in 2012 to 2014, and over 40% in 2017. However, we need to remember that a relatively large share of young people of this age tends to still be studying and as such they do not (necessarily) form part of the labor force; they might still be in full-time education at school or other education institution, while others may have left (or not even entered) the labor force for a number of diverse reasons, such as taking a gap year, traveling, caring for family members or volunteering. By contrast, the youth unemployment ratio in Greece was 16.1% in 2012, 16.5% in 2013 and 14.7% in 2014, and decreased to 9.3% in 2018. So, the highest share of young Greeks being unemployed was recorded in 2013, when the youth unemployment ratio was 16.5% – a considerable difference when compared with the 58.3% youth unemployment rate. Although youth unemployment in Greece was/is relatively high, with considerable economic and social consequences, it was never the case that

half (one in two) of young Greek people were unemployed: the share was nearer to one in six at its peak in 2013 (Eurostat, 2020a).

It can be assumed that low unemployment rates do not sound as good news for the countries' economy and the best time for working people. The problem is that the unemployment rate which is publicly announced by officials of statistics monthly/quarterly/yearly is an insufficient statistical number. Here it is necessary to have a more complex approach. For example, many workers around the world tend to work fewer hours, earn less income or use their occupational skills only partly, compared with what they realistically would be capable of. In general terms, they tend to carry out an activity that is less productive comparing to what they could and would like to do. Unemployment statistics, defined and calculated very strictly, do not take into account such workers, even if their situation is affected by similar causes as those which affect the unemployed, and even if, in many ways, they behave very similarly to the former. Understanding this problem ILO has introduced the concept of labor underutilization which refers to mismatches between labor supply and demand, leading to an unmet need for employment among the population. One of the indicators of labor underutilization is time-related underemployment (ILOSTAT, 2021a).

Generally, the category of **underemployment** can be described as a sort of employment which is “unsatisfactory” (as perceived by the worker) in terms of insufficient hours, insufficient compensation or insufficient use of one's skills. Workers will be classified as persons in time-related underemployment if they are willing and able to change their work situation in order to, for example, work additional hours, use their skills better, increase their income per hour or work in an establishment with higher productivity, etc., regardless of the duration or productivity of their current employment situation. The **time – related underemployment** is expressed as a percentage and calculated by the formula (ILOSTAT, 2021d):

$$TRU (\%) = \frac{\text{Persons in time – related underemployment}}{\text{Persons employed}} \times 100$$

Horizontally Table 2.3 splits the working age population between persons with a job and jobless individuals. Persons with a job fall into time-related underemployment category if they are willing to work additional hours; are available to work additional hours and worked less than a threshold relating to working time. Otherwise, they are treated as employed. Potential jobseekers belong to the category of unemployed, while persons not available and/or not looking for a job constitute inactive individuals (outside labor force).

Table 2.3. Underemployment in labor force framework

	Willing and able	Not willing or not able
Working	UNDEREMPLOYED	Employed
Not working	Unemployed	Outside labor force

Source. Castillo (2011).

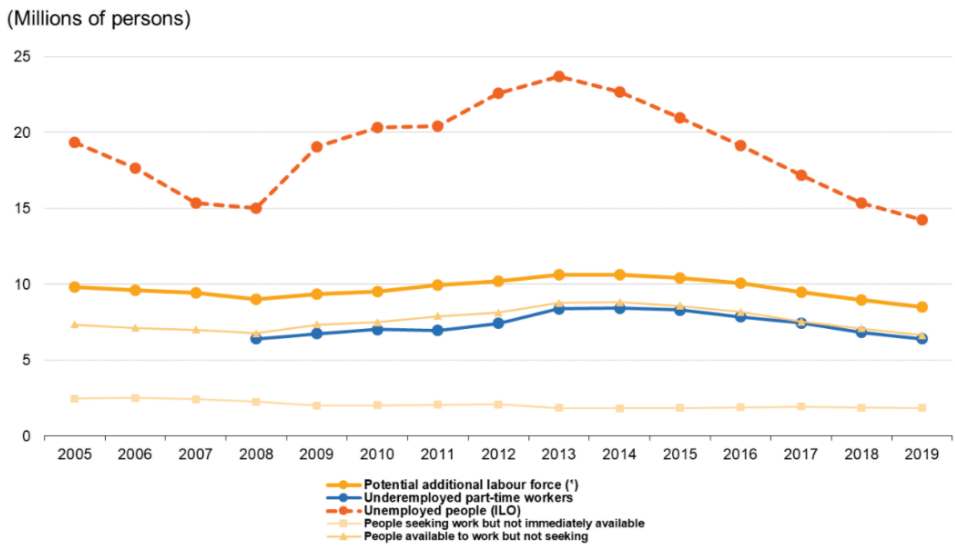
OECD Employment Outlook 2019 (OECD, 2019) presented sectors of industry where underemployment is very common. Service sector workers working in Accommodation and food services, Arts and leisure, Real estate and business services and Trade, Logistics and communication sectors are more likely to be underemployed, as they are based on flexible work schedules because employers try to accommodate more variable customer demand in those sectors. While in Finance and Insurance, Manufacturing and Mining sectors where job’s positions are mostly composed of full-time jobs, declared underemployment rates were relatively low.

Cross-country research presented that underemployment accounts for a significant share of the labor force in many advanced and emerging economies, reaching more than 8% in Argentina, Indonesia, Mexico and Australia. It also tends to be much higher for women than men (MacDonald, 2019).

Thus, returning to the unemployment, the unemployment rate is just a snapshot of labor market which provides no information on other forms of labor underutilization, or on specific characteristics of the employed, the unemployed and persons outside the labor force. For example, statistical reports from Eurostat website find that in 2005 EU unemployment rate was 9.6% (19.4 million unemployed persons) and fluctuated heavily till 7.2% in 2008 (15 million unemployed persons), then steadily increased until 11.4% in 2013 (23.7 million unemployed persons) and dropped to 6.7% in 2019 (14.2 million unemployed persons). However, this view reveals not much information about the situation in the EU labor market. Supplementary indicators should be analyzed. As it is demonstrated in Figure 2.22, the overall size of the potential additional labor force size was relatively stable from 2005 to 2019 at the EU level, with a small decrease from 2005 to 2008 and then steady increase up to 2013-2014, followed by a slow but constant drop again from 2015 to 2019. So, these numbers are in sharp contrast to unemployed persons. The development of the underemployed part-time workers tends to stay close to the potential additional labor force. Nevertheless, the

split of the potential additional labor force into the two sub-groups showed another story, highlighting a trend where the persons available to work but who are not seeking it fluctuated from 7.3 million persons in 2005 to 8.8 million in 2013-2014 and dropped to 6.6 million persons in 2019, following a similar pattern to the number of unemployed persons (Eurostat, 2020b).

Figure 2.22. Underemployment, potential additional labor force and unemployment, people aged 15-74



('): The potential additional labour force is the sum of both categories: people available to work but not seeking and people seeking work but not immediately available

Source: Eurostat (n.d.-b).

However, rising or shrinking unemployment rate is not a big challenge world-wide. Most countries’ governments have solutions and use strong encouraging policies to minimize unemployment rates. Thus, in the coming decades strongly increasing labor supply in older age groups is of great concern. The importance of this is evident in employment statistics. Between 2008 and 2018 people over 55 accounted for 79% of employment growth across OECD countries and 103% in G7 countries. This also suggests finding ways to help older workers remain productive. The economists continue to express concerns and propose solutions like generosity and availability of pension plans, the health support available to workers, and the industrial structure and types of jobs offered (Scott, 2020). Among options related to financing, sustainable work and sustainable employment is one of the huge issues.

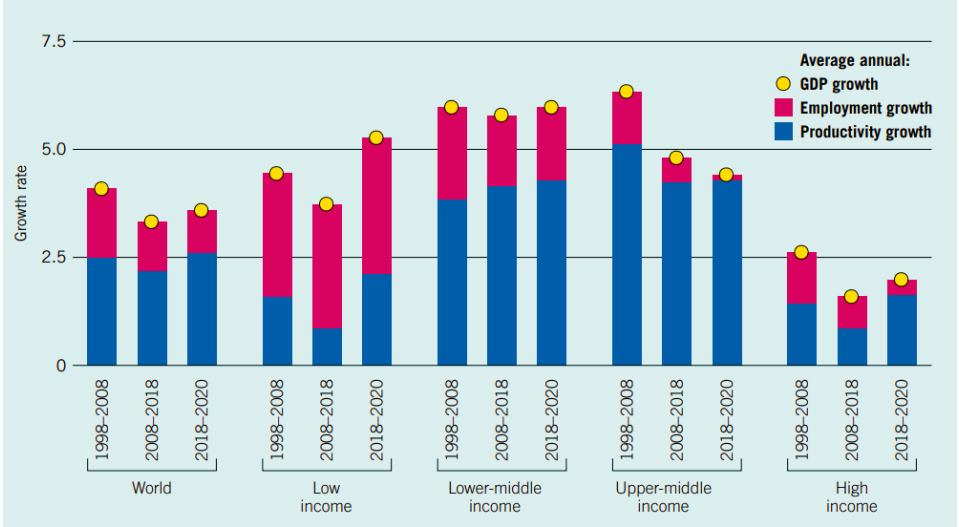
The concept of sustainability derives from ecology and refers to how people handle the environment. The World Commission on Environment and Development [WCED] (1987) defined sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. European Foundation for the Improvement of Living and Working Conditions (Eurofound) developed sustainable work concept, which refers to the conditions that enable the individual to meet their needs through work in the present without compromising their ability to meet their needs through work in the future. Eurofound research on sustainable work measure three indicators: characteristics of the job (e.g., earnings, prospects, intrinsic job quality and working time quality), the characteristics and circumstances of the individual (time availability and care obligations, health and well-being, employability and skills, inactivity and motivation) and policies, regulations and practices (social protection systems, quality services, practices at company level) (Eurofound, 2015). Whereas the concept of sustainable employment addresses only employment relations where workers are able and willing to remain working now and in the future. In order to stay in the workforce and become an older worker, it is important that employees work in healthy, motivated and competent manner, regardless of their age (van Dam, van Vuuren, & Kemps, 2016). Scientific literature studies sustainable employment using three indicators such as employability (individual's ability to stay on labor market), work engagement (employee's role producing positive outcomes both at individual level, for personal growth and development as well as at the organizational level for performance quality (Schaufeli, 2012) and organizational commitment (psychological attachment to an organization) (The Oxford Review Encyclopaedia of Terms, n.d.).

At the first glance both concepts identify the same problem that is staying longer in jobs as individuals grow older. However, sustainable employment focuses on standard employment relationship when a firm hires an employee who is generally granted a minimum wage, overtime pay, holidays, sickness and accident insurance, unemployment benefits, protection against unfair dismissal and discrimination, as well as access to training programs, freedom of association and the right to collective bargaining. While growth of new business models in the digitalized world offered digital labor platforms with new forms of work, sustainable work concept captures other forms of employment as well as availability of individuals to remain active in labor market complemented by policies and proper regulations.

A final problem to be mentioned in this section is the relativeness of the unemployment rate to economic development typically expressed in changes in GDP.

Economists tend to focus mostly on GDP growth as the sum of employment growth and productivity growth. In the 1960s, an economist Arthur Okun found a stable negative relationship between changes in output (GDP) and unemployment. The original article (Okun, 1962) began with the overarching question of how much output the economy could produce under conditions of full employment and estimated that, in the US economy, every one percentage point reduction in unemployment was associated with output growth of three percentage points. In his empirical findings Okun proposed two models of the relation between unemployment and economic growth: the first one is called “gap” model and relates the difference of actual unemployment with respect to its natural value to the production gap (difference between actual and long run output). The second one is called “difference” model and relates the change in production (expressed as changes in the log of real GDP or percentage change of real GDP) to changes in the rate of unemployment (ILO, 2019). Although older studies tend to find a significant relationship between changes in unemployment and changes in real GDP growth, more recent studies by ILO (2019) found that economic growth leads to significant employment growth, but mainly in low-paid jobs. Figure 2.23 presents GDP growth during different periods of time between income groups of countries and globally. The results reported in the case of low-income countries correspond to highest GDP and employment growth, while economic growth in upper-middle- and high-income countries is expected to be driven almost exclusively by productivity growth rather than by employment growth.

Figure 2.23. Average growth of GDP, employment and productivity



Source: ILO (2019).

In addition, challenging situation has been aggravated by the fact that the very concept of employment as basis for Okun's law has been evolving with new forms of under-employment (in terms of both time and income, e.g., platform economy) along with traditional forms of informal employment (ILO, 2019).

Types of unemployment

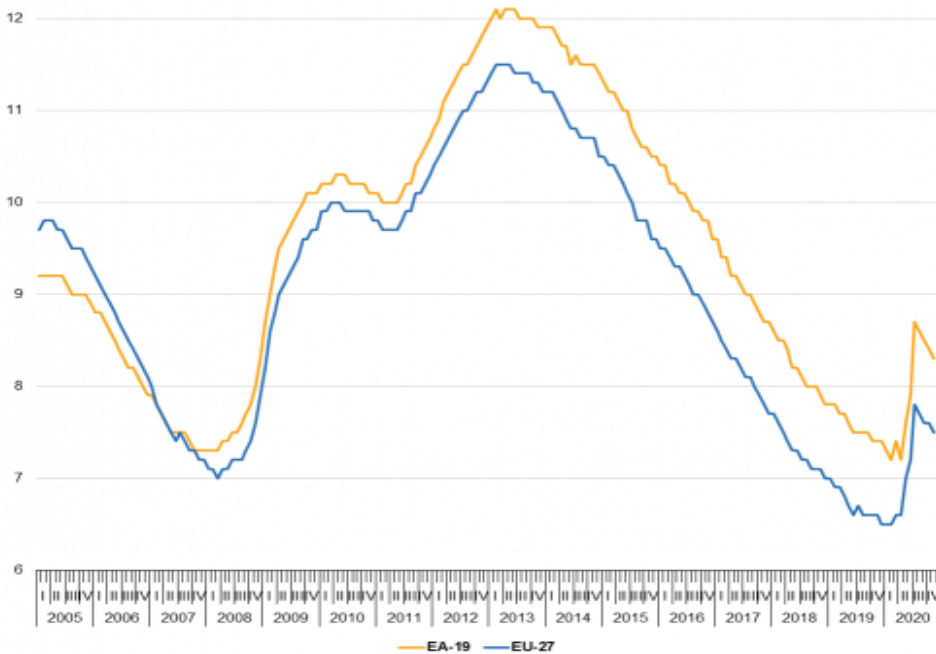
To get started with this Section it is helpful to remember a working definition of unemployment, that can be defined as the number of people (usually aged above 15 years old) who are in any period of time available for work, cannot find it, are not being paid for the work they do or are not in self – employment. The most commonly used measure of unemployment is the unemployment rate, which is the percentage of people who are unemployed and are part of the labor force (deemed capable for work and are actively seeking work).

Although Figures 2.23 and 2.24 present a case for a group of countries (27 and 19, respectively), which are homogeneous, and both the time frame is short and the number of countries small, nevertheless, we can raise some issues which will be discussed further in greater detail that immediately attract attention:

- Unemployment is a dynamic process – it varies over time, with its variations being noticeable both over the short run and the long run. Figure 4 offers a clearer view of the unemployment in the short run, where although the majority of time was characterized by negative unemployment flow (higher employment), the peaks of high unemployment are distinct and exert high influence (especially in the III quarter of 2020).
- It seems that there is not zero unemployment rate – no matter how much the unemployment rate varies across time, it seems that it is always positive. Is this some kind of a rule? Can the unemployment rate ever reach zero?
- A positive average unemployment rate can be introduced in Figure 3, if we drew an imaginary line that would represent the average of the vertical distance of all points on the curve from the x-axis at each point in time, it is obvious that it must be a positive line. Another, and perhaps more important issue is whether the line would have a non-zero slope? If it would, then this implies that the long run unemployment rate has been decreasing for the period 2005-2020.

- Some cyclical movement is noticeable – even in the short time period used for the analysis, it is clear that peaks and troughs are noticeable in the behavior of the unemployment rate (Figure 2.24).

Figure 2.24. Unemployment rates, EU-27 and EA-19, seasonally adjusted, January 2005 – November 2020

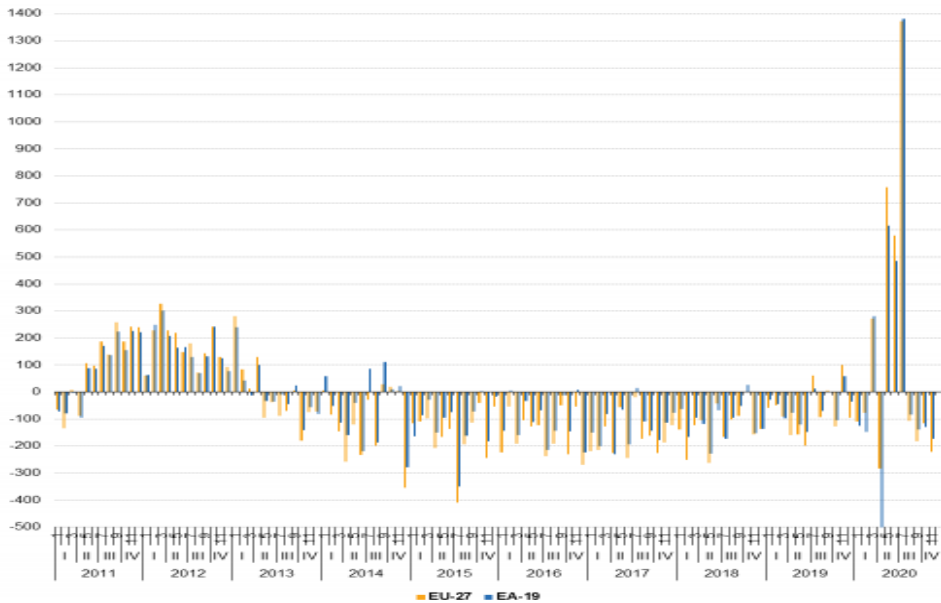


Source: Eurostat (n.d.-d).

In a modern economy, despite the fact how well the economy functions, unemployment is deemed to always exist. There are a number of causes of unemployment. Some of them relate to the low level of economy, others are the result of labor market rigidities.

There is a theoretical necessity to understand the differences between long run unemployment and year-to-year fluctuations in the unemployment rate. The importance of distinguishing between these two concepts, surpasses the simple theoretical framework, and delves deeper into constructing economic policies aimed at tackling unemployment (Figure 2.25).

Figure 2.25. Change in the number of unemployed persons, compared to that of the previous month (in thousands), seasonally adjusted, January 2011 – November 2020



Source: Eurostat (n.d-f).

To understand better the fluctuations in the employment rates, some background information on types of unemployment should be presented. The economics literature introduces these main types of unemployment which include: frictional, structural, cyclical and long-term unemployment.

Frictional unemployment refers to a transitory unemployment. It is also known as “search unemployment” or “wait unemployment”. It indicates the process of matching vacant jobs with job seekers. Such unemployment is caused largely by information asymmetry operating in the market. It is the result of a mismatch between labor supply and demand. The reasons for this mismatch can be manifested in relation to skill, location, preference, etc. Frictional unemployment is different from other kinds of unemployment as it is often voluntary in nature (ILO, 2012).

Structural unemployment occurs where there is a mismatch between jobs on demand and jobs needed, caused by a disparity between skill levels, geographical location, sectoral shifts in the production pattern of a country and other similar structural factors. The most common prescription to fight structural unemployment are policies and interventions that address the relevant structural

constraint, such as skills development, labor mobility and proper dissemination of information in the labor market (ILO, 2012).

Cyclical unemployment is a consequence of a situation where the number of job seekers is higher than the number of jobs available at a prevailing wage rate. Its cause lies in a lack of effective demand for goods and services. It is sometimes also referred to as cyclical unemployment by linking it to business cycles (ILO, 2012).

Long-term unemployment in standard descriptive terms is all unemployed persons with continuous periods of unemployment extending for 12 months or longer (52 weeks and over); it is expressed as a percentage of the overall labor force (long-term unemployment rate) and of total unemployment (incidence of long-term unemployment) (ILO, 2015).

The fact that there has to be some unemployment in the economy, is referred to as the natural rate of unemployment, which is the average rate around which the unemployment rate fluctuates in the economy. In more technical terms, it is the proportion of the workforce unemployed, while the economy is in the steady state of “full employment”. It can be immediately seen that “full employment” and zero rate of unemployment are not synonyms in this context. To get a more concrete idea of what the natural rate of unemployment (denoted as $\frac{U}{L}$) is, we consider an economy where the labor force is constant, so as to focus exclusively on the transition of people between employment and unemployment. Now we refer to the rate of job separation as the fraction of employed people losing their jobs every day (denoted as s). However, the job finding rate is the fraction of unemployed people who manage to find a job every day (denoted as f). To maintain unemployment constant, both of these rates need to be equal, so as neither more people get employed or lose their jobs. The natural rate of unemployment depends on job separation and job finding, presented as an equation:

$$\frac{U}{L} = \frac{s}{s + f}$$

Suppose that $s = 0.01$, which means that 1% of people lose their job each year, and $f = 0.02$, meaning that 2% of people find a job each year. In this numerical example, the natural rate of unemployment is 5%. We can immediately conclude that higher rate of job separation raises the natural rate of unemployment and higher rate of job finding reduces the natural rate of unemployment. Hence, this simple analysis leads to two main conclusions: any policy aimed at reducing long run unemployment, should focus on improving the job searching rate, and

reduce the rate of job separation; and fiscal and monetary policies as the most potent economic policies cannot affect the long run unemployment rate.

Why does such a discrepancy occur between people looking for jobs and people getting unemployed? Well, for one it is due to frictional unemployment, the simple fact that it takes time to find a job, due to the varying preferences of the employers and the employees, the imperfect flow of information of the job market, geographical boundaries, economic conditions. The rapid growth of job-finding platforms and many uses of social media to post and apply for jobs and unemployment insurance are developed as means of lowering frictional unemployment. Another issue is structural unemployment, which is unemployment occurring due to wage rigidity. Wage rigidity is the concept of failure for real wages to adjust rapidly until labor supply equals labor demand. We'll illustrate this with an example: suppose that programmers are paid at a real wage that is above the market clearing wage rate. At such a wage supply will be obviously higher than demand, as more people would want to be programmers and receive high wages. Since this is the case, companies selecting their candidates would have to ration and choose some of them that best fit their demands. The remaining candidates will be unemployed, thus reducing the rate of job finding and increasing the natural rate of unemployment. Thus, under structural unemployment people are simply waiting to get employed. But why does the labor market fail to clear immediately? This is due to three main reasons: minimum wages, unions and efficiency wages.

Minimum wages are the lowest amount that is legally allowed for an employer to pay their employee for a certain job. For most of the workers that earn more than the minimum wage, such a restriction does not present an issue. However, it becomes an issue for the least experienced and unskilled workers. If the minimum wage is set higher than what is their marginal productivity, then firms are overpaying for the employees, and they will opt against hiring more at the going wage. This presents a particularly aggravating issue in youth unemployment.

Unions have a bargaining power to raise wages above the market equilibrium level. When this happens, firms will not hire new employees at the going wages as it will affect profits negatively. Peculiarly unions can affect the wages of employees who are not part of the union, simply because they are in the same job category.

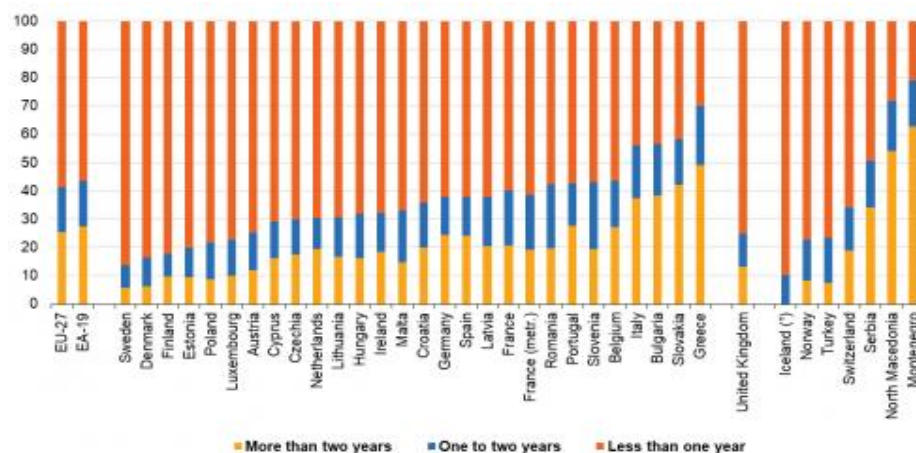
Efficiency wages relate to the concept that higher wages improve productivity of employees. Labor economists have proposed four different theories as to how this might happen: wages influence nutrition, particularly in poorer countries.

Healthier workers are more productive. Another efficiency wage theory is that high wages reduce employee turnover, as most workers quit their respective jobs mainly due to low working conditions, and better conditions offered elsewhere. The third available theory is the adverse selection: better employees who have more information and skills will get better jobs elsewhere, leaving the firm with worse employees that will lower the average quality of the products it offers. Finally, there is the notion that a high wage improves workers effort, which otherwise depends on how much effort workers decide to put forth and cannot be perfectly controlled by the firm – also referred to as moral hazard.

Also referred to as cyclical unemployment is the deviation of the unemployment rate from the natural rate. It can be the result of a variety of economic conditions, determined by short run policy decisions of different economic agents, or as a result of economic recessions. In recessionary times of lower economic activity, it is quite expected that unemployment rates will rise. Usually, cyclical unemployment is associated with lower demand for new employees from businesses, due to decreased economic activity, which triggers additional layoffs. Government policy can alleviate some of the cyclical unemployment through different combinations of fiscal and monetary policies. Tax returns, direct allocations to firms for paying a certain percentage of their salaries, additional employee security, are just some of the many different options policymakers have at their disposal for addressing cyclical unemployment.

Figure 2.26 normalizes unemployment on a scale from zero to 100, and then addresses the type of unemployment in accordance with the longevity of the unemployed status. As it can be seen, for the year 2019, most of the unemployment across the EU countries has been cyclical (short run) unemployment with the term structure of unemployment varying among the different countries. Hence, while it provides an overview that most of the unemployment problems of the EU countries are currently related to cyclical unemployment, it is clear that in some of these countries long-run unemployment is a concerning issue. Based on what was discussed in this Section previously, it is obvious that policies in the national context, which would differ across countries, together with a unifying framework of tackling unemployment are needed.

Figure 2.26. Duration of unemployment, EU-27 and EA-19 and other countries, for the year 2019



Source: Eurostat (n.d.-d).

Statistics of SDG 8 indicators relevant to employment

SDG are measured by indicators, where reliable and comparable data are necessary in order to reach SDG targets. As mentioned in the introduction of this Section, the SDG 8 calls to “achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value” (UN, n.d.). For measuring this goal UN has defined 12 Targets and 17 Indicators. In this Subsection we present only targets and indicators relevant to employment and other labor market related issues.

The first to be mentioned is Target 8.5 which calls upon countries to “achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value”. The second is Target 8.6 which emphasizes the proportion of young people not in employment, education or training. It has to be noted that this target was measured only until the year 2020. In this respect we focus on two indicators of Target 8.5, that is unemployment and earnings from EUROSTAT database. However, a short focus on youth unemployment statistics is presented too.

In general, the definition of earnings is very similar to wage concept and can be explained as any remuneration for work in employment relations. Following ILO

Protection of Wages Convention from 1949 (ILO, 2021a), earnings or wage category include such types of payment as basic payment, tips, bonuses, in-kind benefits, allowances or any similar money remuneration paid by an employer to an employed person for work/services done. Naturally it turns out that earnings are primarily important from employees' point of view because they should guarantee standards of living and provide purchasing power.

Interpretation of earnings indicator mostly covers average wage, average gross earnings and gross hourly earnings. Our analysis covers gross hourly earnings which can be shortly described as remuneration in cash covering the basic wage and bonuses, payable by the employer to the employee directly, including social insurance contributions and individual income tax payable by the employee. Material and temporary unemployment benefits paid irrespective of the source of finance, compensation for unused annual leave, severance pays and similar benefits are excluded.

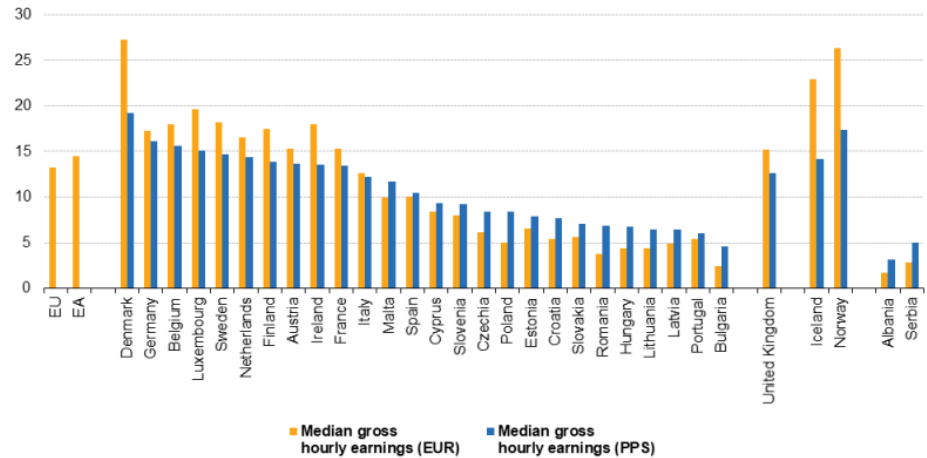
Average gross hourly earnings are calculated by dividing the total gross remuneration by the total number of hours paid.

The last release of data by EUROSTAT presented the snapshot of median gross hourly earnings where median refers to the “middle” gross hourly earnings. For example, in a country with six people who earned gross hourly earnings in EUR equal to 3, 4, 5, 6, 9, and 18, the median would be 5.5 EUR.

Figure 2.27 provides information for 2018 (the latest available at the time of writing this Section) with the highest median hourly earnings in Denmark (EUR 27.2) and the lowest median gross hourly earnings registered in Bulgaria (EUR 2.4). When expressed in purchasing power standards (PPS), again the lowest median gross hourly earnings stood for Bulgaria (EUR 4.6), in contrast to the highest median hourly earnings in Denmark (EUR 19.2).

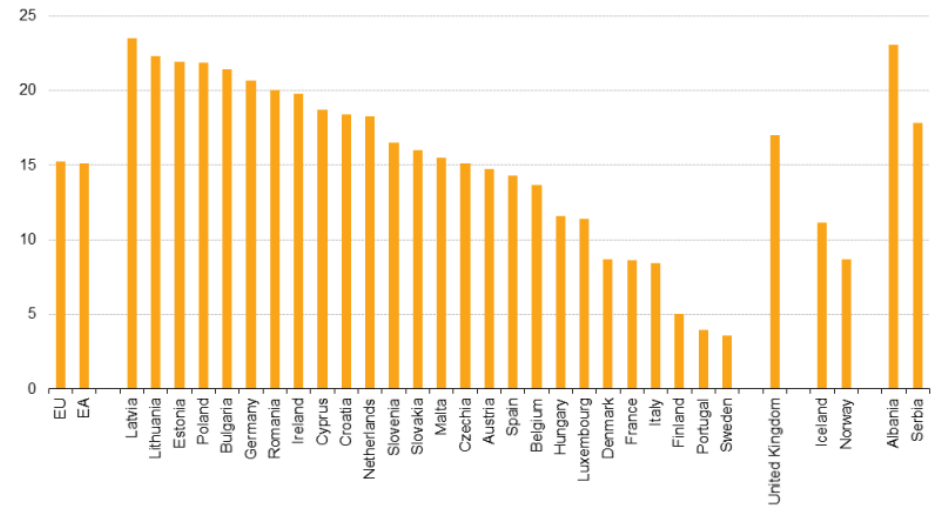
Having looked at the general picture of median hourly earnings, attention should be paid to low wage earners. A full-time employee is defined as a low-wage earner when his/her annual gross earnings are less than two thirds of the annual full-time median gross earnings (Eurostat, 2021a). According to this definition, in 2018 low-wage earners accounted for 15.3% of all full-time employees in the EU-27 (Figure 2.28). The low percentage levels of low – wage earners were reported in Sweden (3.6%), Portugal (4.0%), Finland (5.0%), Italy (8.5%), France (8.6%) and Denmark (8.7%). In contrast, high percentage levels of low-wage earners were found in Latvia (23.5%), Lithuania (22.3%), Estonia (22.0%), Poland (21.9%), followed by Bulgaria (21.4%), Germany (20.7%) and Romania (20.0%).

Figure 2.27. Median hourly earnings, in EUR, all employees EU-27 countries, for the year 2018



Source: Eurostat (n.d.-c).

Figure 2.28. Proportion of low-wage earners (full-time employees), in %, EU-27 countries for the year 2018



Source: Eurostat (n.d.-e).

However, being employed and getting salary for work does not constitute decent living conditions. The statistical results from EUROSTAT found that one in ten employed persons aged 18 years or over in the EU was found to be at risk of

poverty in 2018. The working poor or officially described those “in work and at risk of poverty” (IWP) are defined as persons who are employed (longer than 6 months), but do not earn enough (their income is below the risk-of-poverty threshold, which is set at 60% of the national median disposable income after social contributions) so that they fall below a specified poverty line (Eurostat, 2021b).

When assessing data and indicators relating to IWP, it should be noted that countries’ national statistics do not measure or recognize IWP directly. Working definition of “in-work poverty” first was constructed by international organizations such as the ILO, OECD and EU. At the moment the data from the European Union Statistics on Income and Living Conditions (EU-SILC) are the only source of information for evaluating the level of IWP. These data cover all the necessary dimensions: age, sex, household type, household work intensity, household type, educational level (ISCED), type of work contract, months worked, working time, and country of birth. (Eurostat, 2021b).

Analysis of the IWP rate (cf. Table 2.4) in the EU member states in 2019 demonstrates that the rate of employed persons at risk of poverty was the highest in Romania (15.7%), followed by Spain (12.7%), Luxembourg (12.1%), Italy (11.8%) and Portugal (10.8%). Classifying countries by the lowest IWP rate, Finland represents the lowest in-work poverty rate (2.9%), in Czechia it stands at 3.5%, followed by Ireland (4.3%). According to the figures, the risk of IWP does not make much difference between the sexes in Denmark, Ireland, France, Luxembourg and Finland. However, the evidence from analysis reveals that IWP rate in 2019 among men is higher than among woman, excluding Czechia, Germany, Latvia, Hungary and Norway. This is valuable information for targeted policy formulations where, for example effective men poverty reduction strategies (like enrollment in education) could be implied.

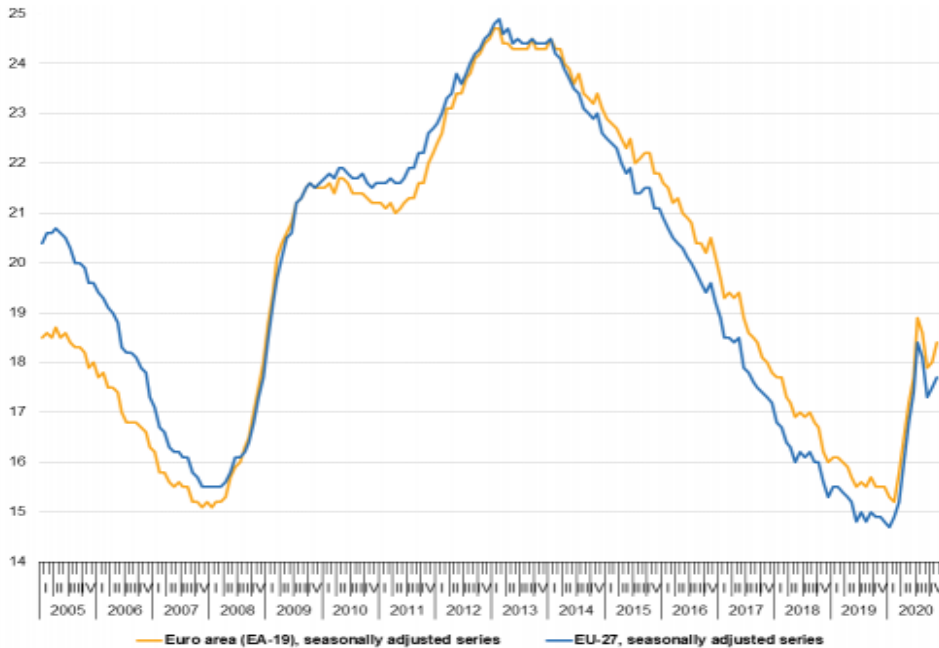
Youth unemployment is the unemployment rate of a specific age range group of the total pool of unemployed people, defined by the United Nations to be between 15-24 years old. Hence, these are people who are in any period of time available for work, and cannot find it, are not being paid or are not in self – employment. The definition of the age range of the group characterized as “youth” is a subject to a debate among economists.

Table 2.4. The share of people in work (% of employed persons aged 18 and over), but at risk of poverty (including gender), for the year 2019

SEX ► GEO ▼	Total	Males	Females
European Union - 28	9.2(e)	9.5(e)	8.9(e)
Belgium	4.8(b)	4.9(b)	4.7(b)
Bulgaria	8.9	9.6	8.1
Czechia	3.5	3.2	3.7
Denmark	6.3	6.4	6.1
Germany (until 1990)	8.0	6.9	9.3
Estonia	10.0	11.0	9.0
Ireland	4.3	4.5	4.2
Greece	10.2	11.7	8.1
Spain	12.7	13.4	11.8
France	7.4	7.4	7.4
Croatia	5.1	5.7	4.3
Italy	11.8	13.0	10.1
Cyprus	6.7	7.2	6.2
Latvia	8.5	8.1	8.8
Lithuania	7.9	8.3	7.5
Luxembourg	12.1	12.1	12.0
Hungary	8.4	8.1	8.7
Malta	6.5	7.8	4.6
Netherlands	5.5	5.8	5.2
Austria	7.6	7.9	7.4
Poland	9.7	10.7	8.7
Portugal	10.8	11.0	10.6
Romania	15.7	18.5	11.6
Slovenia	4.5	5.3	3.6
Slovakia	4.4	5.2	3.4
Finland	2.9	2.9	2.8
Sweden	7.8	8.6	6.7
Iceland	:	:	:
Norway	6.3	6.2	6.6
Switzerland	7.7	7.9	7.5
United Kingdom	:	:	:
Montenegro	9.0	11.7	5.4
North Macedonia	8.5	10.6	5.2
Serbia	9.2	9.9	8.3
Turkey	13.2	14.6	9.9

Source: <https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do#>

Figure 2.29. Youth unemployment rates, EU-27 and EA-19, seasonally adjusted, January 2005 – November 2020



Source: Eurostat (n.d.-g).

Figure 2.29 presents quarterly rates of youth unemployment for the respective period for the EU-27 and EA-19 countries. Besides the apparent similarity in the movement of both curves, as it would be expected since the majority of countries appear in both groups, there are some issues worth addressing:

- Youth unemployment rate experiences the same as the overall unemployment rate – if you compare it with the movement of the unemployment rate in Figure 2.26, the similarities are evident.
- Youth unemployment is traditionally higher than overall unemployment – one of the most frequently addressed and aggravating issues of unemployment, is that it seems to be a bigger problem for young people, particularly in developing countries.
- Youth unemployment is more sensitive to short run economic fluctuations – if we compare the magnitude of the raise in the youth unemployment with respect to the overall unemployment rate in Figure 2.26, it is noticeable that young people struggled more finding jobs and faced more layoffs during the 2008-2012 period.

The empirical fact that youth unemployment is on average at a higher rate than the overall unemployment is mainly attributed to the mismatch and the skills gap of the knowledge offered by the formal educational process and the demands of the companies. Such a skills' gap is attributed to the high pace of growth and the dynamics of change in the private sector. The educational sector in general has a difficulty keeping up to date with the new processes undergoing in companies. As a result, young employees cannot work at a company without previously passing a process of on-the-job training. Additionally, although a more pressing issue in developing countries, then in developed ones, the access to education itself presents an issue to the higher unemployment rates of youth. An additional issue is that the evidence suggests that young people with fewer skills have higher unemployment rates, and their jobs are more vulnerable, and the positive correlation between employment rates and education levels holds for secondary, post-secondary and tertiary education.

Regulations and minimum wages are different issues aggravating youth unemployment overall. Minimum wages set at higher rates than the actual productivity of the employees, causes firms to be precarious in their hiring, and generally opt against hiring more workers. In addition, the development of temporary work relations, such as internships, part-time work, seasonal jobs and other short-term arrangements, have left young people particularly vulnerable to the dynamic nature of the labor market, and due to such arrangements, once their contracts do expire, no redundancy payments are received. Some countries introduce different schemes of assistance to young unemployed people, which in the long run discourages them from active job searching, and it results in a gradual deterioration of the skills learned throughout the educational process.

The unfair labor market conditions and generally higher unemployment rates for women are another widely discussed academic topic. The gender gap in the unemployment rate in the EU-27 countries is present, although it is less evident when compared to other parts of the world. The average male unemployment rate for EU-27 countries for 2020 was 7.15%, while the average female unemployment rate for the same period and group of countries was 8.00%. According to the ILO not only women unemployment rates are higher, but their jobs are less paid on average and are more vulnerable, in low-quality conditions. Globally on average 75% of men are employed, and only 49% of women, representing a gap of 26 percentage points. In some countries in Africa and the Middle East, this gap is more than 50 percentage points. The main causes of such a gender gap are attributed to gender roles, cultural and religious beliefs, customs and traditions.

Referring to gender pay gap the European Commission and ILO estimates that women continue to be paid less compared to men (EC, 2020). The indicator measuring these disparities is gender pay gap (GPD) which is calculated as the difference between the average gross hourly earnings of male and female paid employees as a percentage of average gross hourly earnings of male paid employees (Eurostat, 2021c). The empirical data from Eurostat reveals that the gender pay gap is generally much lower for new labor market participants and continues to grow with age, also women working in financial and insurance sectors tend to be paid less than men. Also, the gender pay gap is higher within private sector companies. The main causes for the gender pay gap should be mentioned, e.g., taking career breaks (maternity leave), working unpaid hours (taking care of household), and stereotypes (female education and jobs).

KEY TERMS

Unemployment rate, underemployment, youth unemployment, sustainable employment, labor earnings, minimum wage.

SUBCHAPTER SUMMARY

This Subchapter starts with defining the main concepts behind the term unemployment, presenting the formula used for calculating the rate of unemployment and dissecting the categories that make up the formula, providing detailed explanations on the topics of labor force, participation rate, working age population. It then defines the concept of underemployment, discussing it in greater detail. Next Subsection presents the main types of unemployment, namely: cyclical, frictional, structural and long-term unemployment. Recognizing the different types of unemployment is related to their potential causes and means of addressing them. This is particularly useful to current and future policymakers in designing efficient policies for tackling unemployment issues. Throughout the presentation of these topics, visualization is provided in the form of different graphs and tables, in order to present a better platform for grasping the diverse terminology. Following Subsection focuses on the Sustainable Development Goals (SDG) with a specific attention to the indicators that are related to unemployment. The Section goes on to present and discuss a series of such indicators, providing data and discussion for each of the indicators. The discussion con-

cludes with a brief presentation of the topics of youth unemployment and the gender gap in unemployment, issues that have raised lots of attention among labor economists in recent times.

DISCUSSION QUESTIONS

1. What is the employment situation in the country (region) where you live?
2. Why do countries need minimum wages? What would you suggest as a “fair minimum wage”?
3. Do you agree with the legal youth unemployment definition and the age group selected? What would be your choice? How would the inclusion/exclusion of some age groups affect the percentage of unemployed and the policies designed for their employment?

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2.2.2. Financialization

Tomasz Zieliński^a

LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- recognize the changes in the role of finance in the global economy,
- predict the implications of the changes for business,
- understand the phenomenon of financialization,
- analyze the impact of financialization on the real economy and society,
- indicate possible ways of reducing financialization.

Introduction

The economy of any country consists of the real and financial spheres. The material and financial processes, complementing each other, should serve the effective production, distribution, exchange and consumption of goods and services that meet human economic needs. The centuries-old evolution of the commodity and money economy model leads to the development of diversified relations between material and financial phenomena.

Assuming that the real sphere of the economy serves the satisfying human living needs, finance can only be perceived as a result of economic phenomena. The **servile nature of finance** makes them only a manifestation of the economic activity of the enterprises and the households acting in the real sphere. In such a model, the financial sphere of the economy should be, on the one hand, efficient enough not to limit activity in the real economy, and on the other hand, it

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should be cheap and invisible enough not to burden the real economy with its activities and not consume profits generated in the real economy.

The deterministic approach could also be considered if finance becomes the cause and not the effect of economic processes. In that case, instead of just reflecting on real processes, finance becomes a tool, an instrument for achieving goals, including those that are not purely of a monetary nature. The **deterministic approach** contradicts the premise that the superior function of the financial system is to participate in the creation of a commonly accepted means of making transactions (money, purchasing power) and to facilitate its mobility between nonfinancial economic entities.

The strong relationship between the real and the financial spheres of the economy cannot be denied. It cannot also be forgotten that not all financial phenomena are reflected in the real sphere. For this reason, a distinction should be made between **the financial system of the real sphere** and **autonomous finance**. As the market economy develops and its financial infrastructure grows, the turnover in the autonomous financial sphere grows rapidly. The motive for undertaking operations in the autonomous sphere of finance is not the creation of purchasing funds for the purchase of tangible assets. The key goal is to increase income and wealth in the abstract form of cash funds and financial assets. This makes it possible to distinguish operations undertaken within the real economy finance system from those undertaken in autonomous finance. And so, if there is a purchase (sale) of foreign currencies for the settlement of a foreign contract for the import (export) of goods and services, then they should be attributed to the finances of the real sphere. But the same transactions of purchase (sale) of foreign currencies undertaken to earn a profit on the difference in exchange rates should be included in the autonomous sphere of finance (Owsiak, 2003).

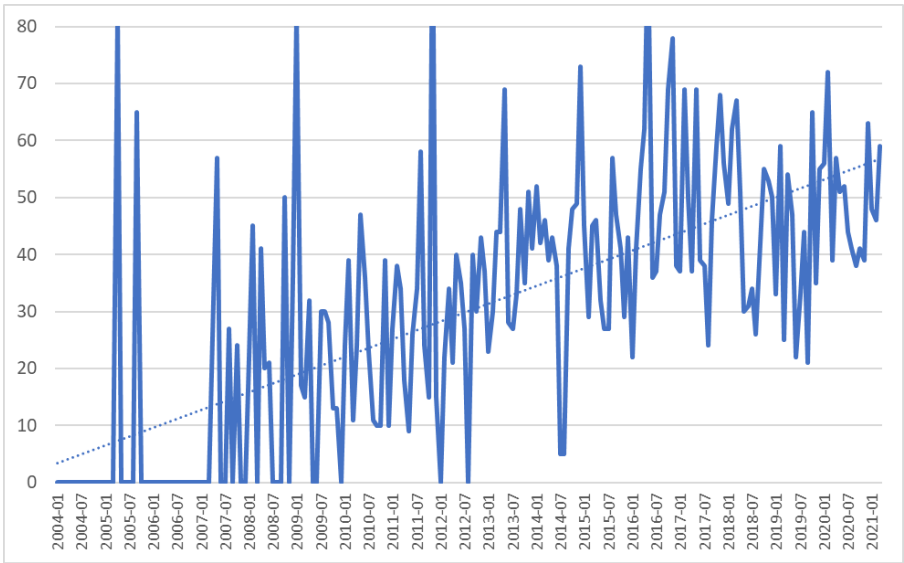
For the last decades, the economies of the world have undergone profound transformations. As the effect, the deterministic approach became prevailing. These changes lead to the accumulation of various types of imbalances. They result in the emergence of successive economic crises, the vast majority of which are financial. Although the financial sector is seen as the main source of these instabilities, the neo-liberal doctrine has accustomed us to seeing the development of the financial sector as clearly positive for the economy. Proponents of such views believe that the growth of the financial sector accelerates economic growth by increasing resources efficiency. In their opinion, financial intermediation, in the same terms as the real sphere, is a source of economic added value, leading all parties of the transaction to a win-win result (Gruszecki, 2012).

The increasing frequency and strength of successive crises call for a critical look at that approach. The questions that arise on this occasion may in particular concern the limits of optimal expansion of the financial system, especially to the real economy, as well as the degree of its autonomy. The search for answers to these and other more detailed questions has led to the precise distinction of the phenomenon called **financialization**.

Financialization – in the pursuit of the definition

The literature on financialization is relatively new. Some of the earliest papers on financialization have been presented at a 2001 conference and later collected by Epstein in the publication “Financialisation and the world economy”(Epstein, 2005). Since then, the interest in the phenomenon has grown dynamically. According to Google Trends, Google users search nowadays for the term “financialization” about four times more often as they used to at the beginning of 2004 (Figure 2.30).

Figure 2.30. Frequency of searching for “financialization”



Source: Google Trends.

Despite growing interest, which took place in the aftermath of the financial crisis in 2008, the term “financialization” is still ambiguous. It can be very loosely defined as the concept that covers many processes, structures, practices, and

outcomes at different scales and in different time frames. Furthermore, sometimes financialization is considered as the **explanandum** (the phenomenon to be explained), sometimes the **explanans** (the thing that explains). At other times it is not even clear which of the two it is. Financialization is not that different from other concepts whose academic (and media) popularity rose quickly and which are simultaneously criticized for being vague (i.e., globalization, neoliberalism). The popularity of these concepts could come mostly from their “ability to transcend different lines of argument, originating from different disciplines, and taking place at different scales” (Aalbers, 2019, p. 3). However, it proves the inability of existing perspectives, concepts, and data to deal with the complex realities of contemporary societies.

During the discussion on the dominant contemporary trends, financialization is usually mentioned next to neoliberalism and globalization (Epstein, 2005). The objective of the lively discussion is not only the importance of financialization but even its definition. An important starting point for considering financialization was a publication entitled “Finance capital: A study of the latest phase of capitalist development” (Hilferding, 1981). It defined the concept of “financial capitalism” as a natural, final phase of capitalist development (Goldstein, 2009). **On the macroeconomic level**, “financial capitalism” refers to the rise to power of financial capitalists and the impact of finance on real capital accumulation, the production and distribution of surplus-value, rising inequity, macro instability, economic crisis, and macro policy formation. Financialization triggered the debate on the substitution of industrial profits with financial profits and of a finance-led accumulation regime (Goldstein, 2009). **On the micro-level approach**, changes in corporate governance and firm behavior have been considered, including how the “shareholder value movement” has impacted the business activity. The microeconomic consequence of the prevailing Shareholder Value over the Stakeholder Value perspective is an increase in the financial activity of nonfinancial enterprises, a short-term horizon of activity, and excessive risk-taking. According to Hilferding’s conclusions, the aforementioned trends caused by finance capitalists and financial markets have captured economic outcomes and policies in the neoliberal era.

The mainstream debate on financialization has focused on identifying the expansion of the financial sector into various fields of economies and societies, as well as analyzing its effects on economic growth, employment, inequality and democracy, among other variables. A profound transformation has taken place in modern capitalism. At the background of the discussion over financialization lays the thesis of an “increasing importance of financial markets, financial mo-

tives, financial institutions, and financial elites in the operation of the economy and its governing institutions, both at the national and international level” (Epstein, Jayadev, 2005, p. 46). Theoretical discussion over that idea oscillates between acceptance of natural evolution of market economy by growing importance of the financial sector and related industries such as real estate and insurance, grouped under the FIRE acronym (Assa, 2016) on the one hand and warnings of the destructive role of finance in economic, social, and ethical aspects of sustainable development on the other. Frame schedule of the discussion over financialization should comprise of pursuing the answers for a few key questions: what are the key drivers of financialization, what are its key symptoms, what is its impact on the real economy and finally how to cope with it.

The long list of the phenomenon that is associated with financialization, includes among others: the ascendancy of shareholder value, focusing on financial activity and short term profit of nonfinancial companies, rising levels of public and private debt, increasing economic inequality, new strategies and sources of profit in the financial sector, growing global imbalances and increased fragility of financial markets.

The growing contribution of the financial sector in the economy

Discussion over financialization addressing a more general macro approach may focus on the following key measures of financialization:

1. The growing contribution of the financial sector in GDP compared to the real sector.
2. Growing revenues of the financial sector compared to the real sector.
3. The marketization of the economy.

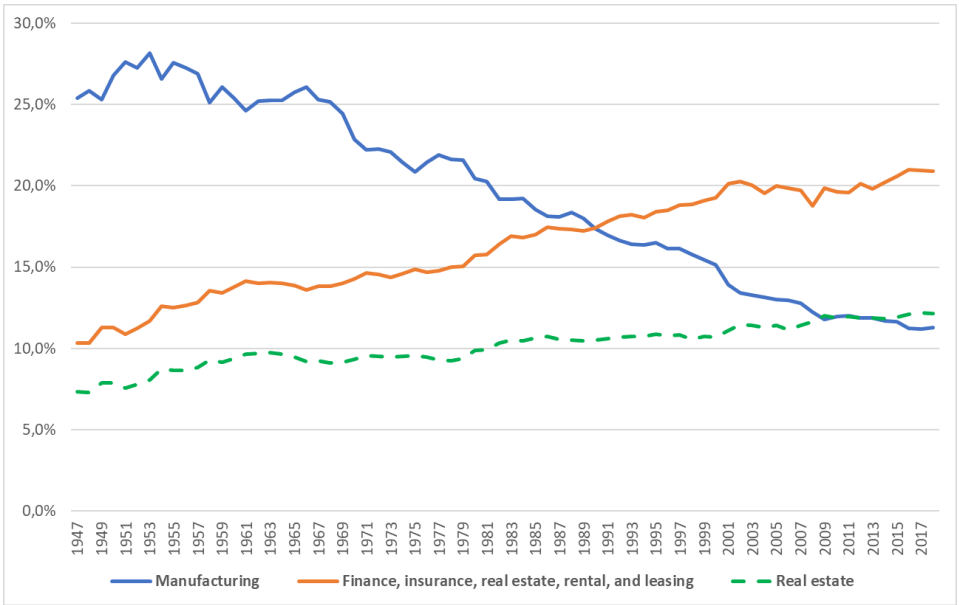
Contribution in the GDP of the financial sector compared to the real sector

Applied measures of financialization should embrace primarily the scale of financialization (total size of financial assets, employment in the financial sector, revenues from the financial activity in the industry, etc.) and secondarily, its impact on the economic growth. The most commonly used measures covering

the above-mentioned aspects of financialization refer to the GDP aggregate presented as the sum of the gross value added of all economic sectors, plus taxes on products reduced by subsidies on products. From our perspective, the issue of key importance is the contribution of finance in GDP compared to manufacturing (Zieliński, 2019).

Long series of the data collected for the period 1947-2018 for the USA economy enables us to present the contribution of Value Added Output for FIRE sector in the Gross Domestic Product and compare it to the contribution of Manufacturing in the GDP (Figure 2.31).

Figure 2.31. FIRE Sector vs. Manufacturing as % of GDP



Source: Based on: Yuskavage & Fahim-Nader (1997); Lum & Moyer (2000); Statistics of Bureau of Economic Analysis (n.d.).

The output of the country’s manufacturing sector declined from over one-quarter of the gross domestic product (25.4%) in 1947 to only 11.3% in 2018. At the same time, the contribution of the FIRE sector (finance, insurance, real estate, rental, and leasing) doubled from 10.3% in 1947 to 20.9% in 2018.

In the 1990 FIRE overtook the manufacturing sector. Even more stunning is, that in 2010, manufacturing had the same output as “a bunch of real estate agents and house-flippers” (Global Macro Monitor, 2019). The real estate sector became the largest industry sector of the U.S. economy in terms of value-added output, now

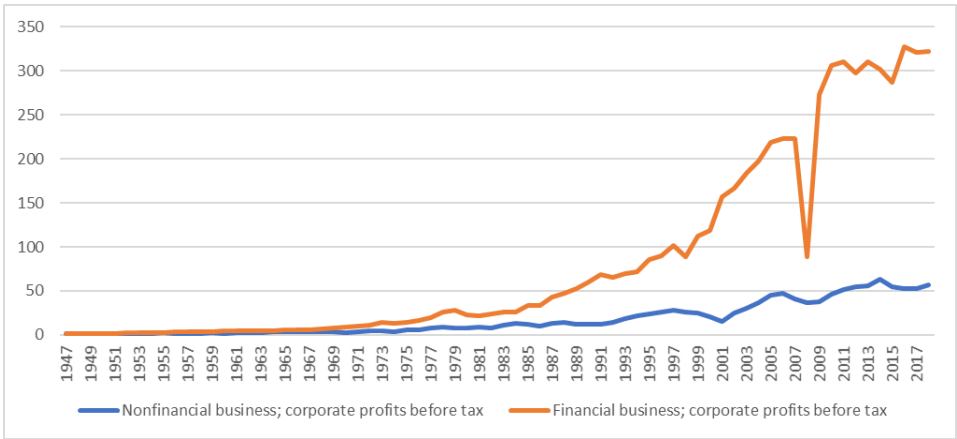
surpassing manufacturing by 0.8% of GDP. This phenomenon is particularly important because of the particularly sensitive role that real estate plays in meeting social needs.

Revenues of the financial sector compared to the real sector

The growing share of the financial sector to the nonfinancial sector can also be observed when comparing revenues. According to numerous studies (Baker, Epstein, & Pollin, 1998; Orhangazi, 2008; Rabinovich, 2018), the profit rate of financial corporations in the 1970s and 1980s was well below that of nonfinancial corporations (NFCs) in the most developed countries, including the USA. But starting from those years on, the profits of financial institutions started to rise dramatically relative to the profits of nonfinancial corporations.

This phenomenon is spectacularly illustrated in the Figure 2.32 showing the growth dynamics of financial corporate business profits before tax vs. nonfinancial corporate business profits before tax.

Figure 2.32. Dynamics of profit growth of the financial and nonfinancial sector in the USA in 1947-2018 (1947 = 1)



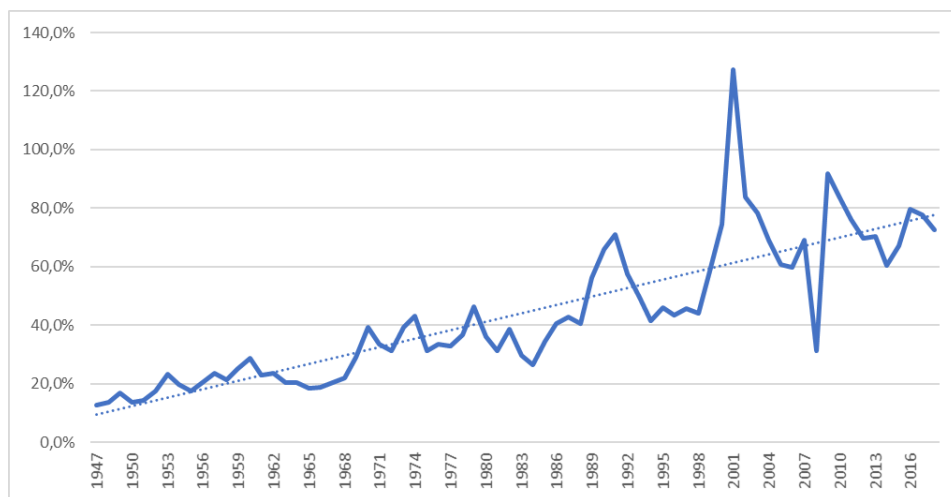
Source: Federal Reserve Bank of St. Louis (n.d.).

Starting from 1947, profits of financial institutions grew until 2018 at over six times faster than the profits of nonfinancial institutions. The chart confirms the dynamic increase in the growth rate of the financial sector profits starting from the 1980s. It also spectacularly illustrates the sudden collapse of the financial

sector following the 2008 crisis and equally rapid recovery with even stronger dynamics of the growth in its aftermath!

Similar conclusions could be drawn from the investigation of the relation of the financial corporate business profits before tax to nonfinancial corporate business profits before tax (Figure 2.33).

Figure 2.33. Financial corporate business profits before tax to nonfinancial corporate business profits before tax in the USA in 1947-2018



Source: Federal Reserve Bank of St. Louis (n.d.).

In 1947 financial sector gained profit equal to only about 10% of the outcome of the nonfinancial sector dominated by manufacturing. In the following years, the financial sector grew compared to the nonfinancial sector at an average rate of approx. 1% per year. As a result, at the end of 2018, the profits of the financial sector accounted for almost 80% of the profits of the nonfinancial sector, and in the first years of the 21st century, the profits of the financial sector were even higher than the profits of the nonfinancial sector.

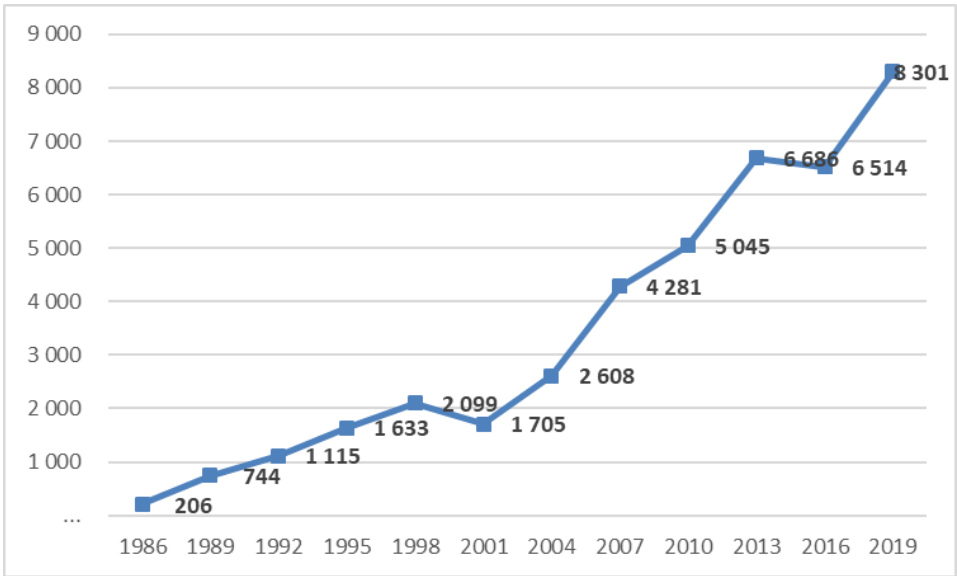
Marketization of the economy

An important measure of the financialization, having a strong social dimension, is the increase in its assetization and marketization. It became a result of the progressing deregulation, globalization and computerization. Jointly and severally they led to reducing a large number of goods and values, often having an originally social, cultural or emotional dimension, to limited, economic categories

valued mostly by their market value (Kulawik, 2010). Widespread assetization made it possible to carry out commercial transactions based on the market rules of supply and demand. The growing number of goods and values converted into tradable assets, along with more and more perfect transaction mechanisms (driven by the IT revolution and deregulation), led in turn to the widespread “marketization” of economies. Increasingly, bilateral transactions concluded between business partners are replaced by transactions concluded at the anonymous markets.

According to the 12th BIS Triennial Central Bank Survey of Foreign Exchange and Over-The-Counter (OTC) Derivatives Markets, the daily volume of OTC foreign exchange transactions amounted to more than 206 billion dollars each day in 1986, in contrast to 8301 billion per day in 2019 (Figure 2.34) (Bank for International Settlements [BIS], 2019).

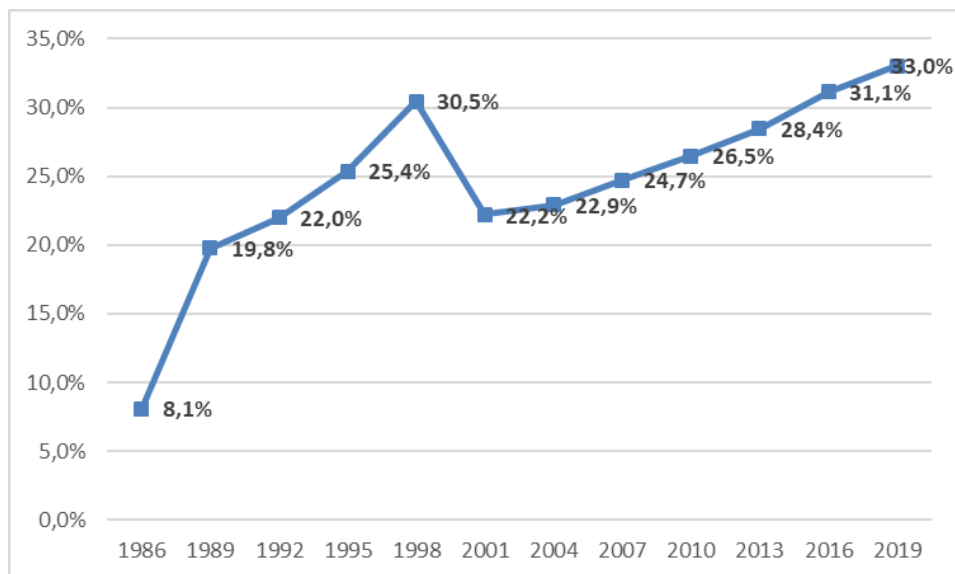
Figure 2.34. World daily volume of OTC foreign exchange transactions



Source: BIS (2019).

The expansion of the financial markets is accompanied by a sharp change in the structure of market transactions. The transactions concluded to protect against risk (hedging) became dominated by speculative transactions, concluded solely for financial reasons. It can be proved by the analysis of the relation of the daily volume of OTC foreign exchange transactions to the total world export of goods and services (Figure 2.35).

Figure 2.35. The daily volume of OTC foreign exchange transactions to Total world export of goods and services



Source: BIS (2019); International Monetary Fund (n.d.); Statista (n.d.).

As for 1986 daily turnover of OTC foreign exchange transactions amounted to 8.1% of the total yearly export of goods and services, in 2019, the respective value rose to over 33%.

According to the economist Bernard Lietaer, author of “The Future of Money”, as recently as 1975 roughly 80% of foreign exchange transactions involved the real trading of a product or a service. The remaining 20% were speculative bets made on the value of currencies going up or down (buy it before it rises, dump it before it drops). By the late 1990s, that ratio had changed dramatically. In 1997 the percentage of foreign exchange which involved the real economy transactions was only 2.5%. Nowadays, the picture is even starker. According to the Global Policy Forum, in 2011 only 0.6% of foreign exchange could be traced to genuine international trade in goods and services. “Money,” wrote Ayn Rand, “is a tool of exchange, which can’t exist unless there are goods produced and men able to produce them.” (Rand, 1988, p. 315). This is no longer true. Money itself has become the good most traded. It is critical to understand the size and nature of this behemoth industry to dispel the myth that as a country (and globally) we are united in a process of restoring economic stability. We are not. The money is made in predicting the peaks and troughs. No peaks and troughs, no profit. The welfare of this enormous gravy train depends, in large part, on insta-

bility. The idea that we are rebalancing the economy is an illusion. It is impossible to create stable, balanced economies when vast interests within them have every incentive to drag them into instability (Andreou, 2013).

Financialization of nonfinancial companies

In the past twenty years, the increasing financialization of nonfinancial firms has been noted for almost all sectors of the economy, and has, arguably, become the most widely discussed dimension of financialization. It leads to fundamental changes in the sphere of management and ownership of large enterprises. The basic reason for these changes was the change in the ownership structure. Due to the expansion of enterprises and their more and more global range of operations, new capital has become necessary for their functioning and further expansion. Increasingly, the capital of the founders and original owners becomes insufficient. In this situation, financial institutions are becoming the source of the necessary capital for nonfinancial firms.

In the 1950s, US households held approximately 90% of corporate stocks. Fifty years later their share was just 42%, whereas the share of institutional investors, including pension funds, had increased to 46%. Financial owners usually treat their participation in a nonfinancial entity primarily as one of the temporary and alternative forms of investing capital, and not as actual long-term involvement in its activities and development. In the wake of the portfolio-type involvement of financial investors, the stakeholder value-added paradigm has been replaced with the stockholder one.

Since the 1980s nonfinancial firms are increasingly led by CEOs with a financial or legal background. The priority task of managers has become to maximize profits and constant concern for the growth of share prices. The rules of Wall Street are increasingly becoming the rules outside Wall Street. The corporate narrative has also become financialized. The idea of shareholder value has become dominant. Senior managers became rather agents of shareholder value maximization than skilled professionals. Financialization of management systems became to indicate the possibilities of generating additional income beyond economic entity basic activity and many senior managers became busier with communicating positive news to credit rating agencies and stockholders than with innovation or production gains.

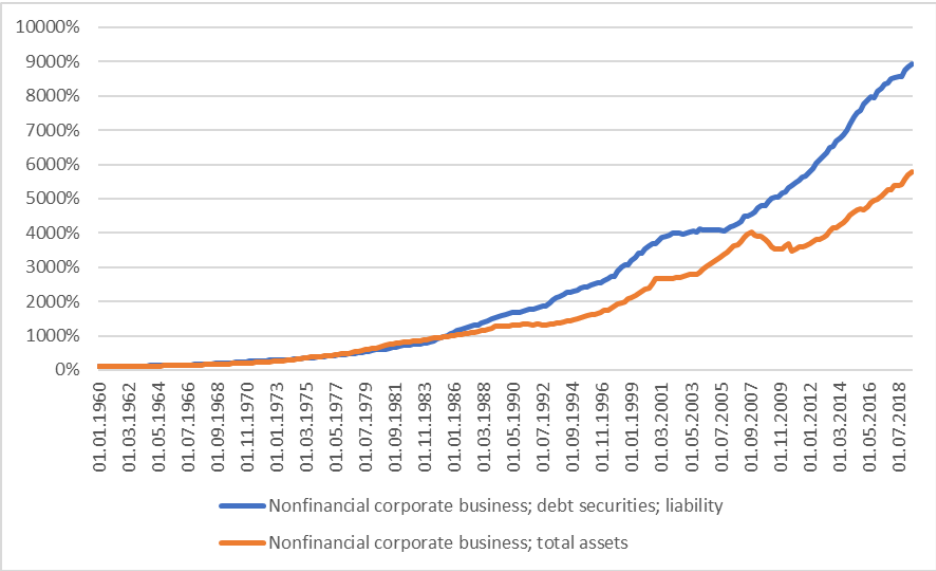
The growing participation of financial investors in the ownership structure results in a greater propensity for financial accumulation and prioritizing in leveraged buyouts, stock repurchases, mergers, and acquisitions over long-term profitability. The implementation of the shareholder value concept takes into account, in particular, the valuation of enterprises by the value of all organizational and economic resources that can be re-employed to ensure the highest possible rate of return on capital. Financialization changes the way money is made in nonfinancial industries. There generally is a narrow focus on outsourcing and short-term profits at the expense of integrated development, long-term investment, and nonfinancial innovation. As a result, nonfinancial firms have increased financial flows to the financial sector through interest payments, dividends payouts, and share buybacks.

Along with the growing tendency to shorten the time horizon of investment decisions, this leads to the excessive exposure of the economic and financial indicators taking into account, first of all, short-term profitability, and not long-term stability of the development. Many enterprises in developed economies over-focus on short-term goals and benefits paying less attention to building the foundations for long-term growth.

As the profit rates in the financial industry for some time were higher than in most of the so-called real economy, pressure on short-term profits drives the managers to financial investments. As a result, nonfinancial corporations increasingly derive profits from financial activities and own a greater proportion of financial relative to nonfinancial assets. Moreover, once a firm is investing in financial assets, it will most likely use also gained profits to expand such activities. Even if that strategy is tempting for its higher expected profitability, one should take into account, that financial commitments are volatile and may jeopardize the survival of the firm, or at least its nonfinancial activities.

The paradigm of the priority role of economic growth is currently contributing to the search for all available methods of achieving this goal. Leverage has become a common financial instrument for profit maximization. Nonfinancial entities increase their debt under the constant pressure of short-term profits (Figure 2.36).

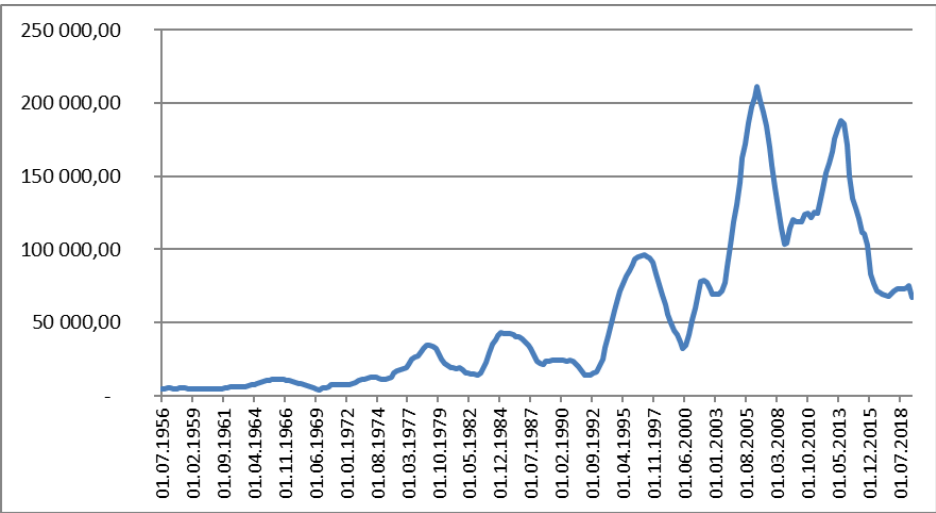
Figure 2.36. Dynamics of USA nonfinancial corporate business liabilities and total assets



Source: Based on: Federal Reserve Bank of St. Louis (n.d.-b).

In the example of nonfinancial corporates, a much stronger increase in debt compared to the increase in total assets can be seen.

Figure 2.37. 5 Year Standard Deviation of USA nonfinancial corporate business profits before tax (millions of dollars)



Source: Based on: Federal Reserve Bank of St. Louis (n.d.-b).

Growing corporate indebtedness is inevitably accompanied by increased exposure to risk, which poses an increasing threat to the stability of economic systems. This is evidenced by the increasing volatility of nonfinancial corporate business profits in recent years (Figure 2.37).

Financialization of the commodity markets

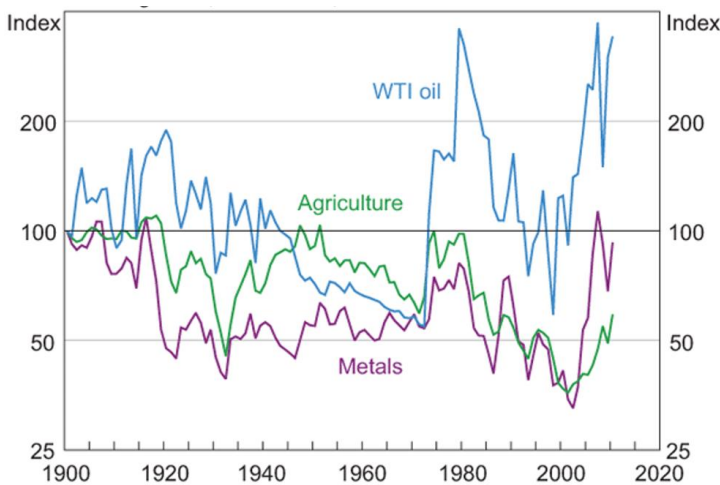
The phenomenon of widespread marketization of the economy, mentioned in the previous section, has particularly affected commodity markets. Not as the financial market, a commodity market is a physical or virtual marketplace for buying, selling, and trading raw or primary products. There are currently about 50 major commodity markets worldwide that facilitate trade in approximately 100 primary commodities. Commodities are split into two types: hard and soft commodities. Hard commodities are typically natural resources that must be mined or extracted (i.e., gold, rubber, and oil), whereas soft commodities are agricultural products or livestock (i.e., corn, wheat, coffee, sugar, soybeans, and pork). Commodities can be invested indirectly or directly. As for the first, an investor can purchase stock in corporations whose business relies on commodities prices or purchase mutual funds, index funds, or exchange-traded funds (ETFs) that have a focus on commodities-related companies. The direct way of investing in commodities is usually based on buying a futures contract, which obligates the holder to buy or sell a commodity at a predetermined price on a delivery date in the future. Actually, in most cases, the obligation associated with the fulfilment of a contract for the purchase or sale of the commodity does not require a physical delivery and only the conclusion of an opposite contract, for example, on the SPOT market. That way, typically nonfinancial goods become the subject of market trading, dominated by financial, speculative transactions. The financialization in commodity markets most often is illustrated by:

1. Increase in price levels and volatility in commodity markets.
2. Increase in the correlation between commodity prices and stock market prices – commodities as components of financial investment portfolios.
3. Increase in the correlation between prices of various commodities – buyers of commodities stopped to purchase them for the needs of the real economy focusing on particular commodities required for conducting primary real business. Instead, they started to trade with various commodities adopting a portfolio strategy.

4. Rate of growth of the commodities' prices which overhauls the growth of economies (GDP).

The past decades have witnessed a large increase in the prices levels and volatility of many commodities. The process lasting for a long time was only for a certain period disturbed by the falls during the global financial crisis but regaining or exceeding historical tops soon after that. These price changes have raised some concerns for policymakers. One of the key concerns regards the potential for rising prices of commodities for countries relying on the export of particular raw resources (metals, fuels). The problem is unexceptional also for some developing nations particularly those concerned about rising food prices (Figure 2.38).

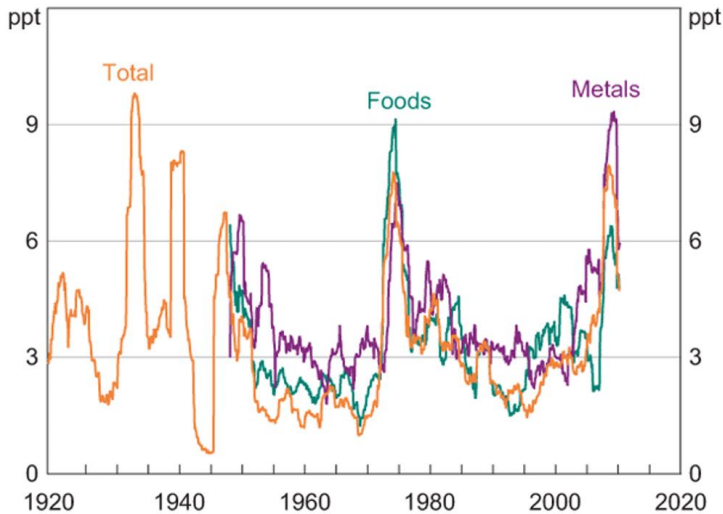
Figure 2.38. Real Commodity Prices by Sector – log scale, 1900 = 100, relative to US GDP deflator



Source: Dwyer, Gardner, & Williams (2011).

The twofold explanation of the growing level and volatility of prices (Figure 2.39) in commodity markets is based on the fundamental approach or the financial approach.

Figure 2.39. Real Commodity Price Volatility – CRB indices, 2010 prices, relative to US CPI



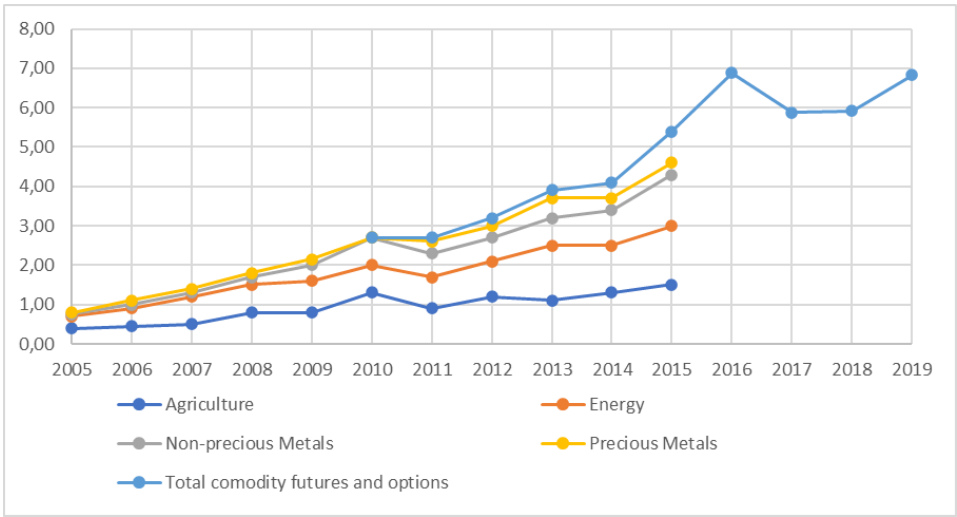
Source: Dwyer, Gardner, & Williams (2011).

Some analysts state that the substantial increase in commodity prices over the past decade has been supported only by some fundamental drivers. One of the most significant has been the shift in the composition of global growth. Some countries (particularly China) became the engines of the world growth. Since these emerging market economies entered a commodity-intensive stage of development, shifting global demand towards commodities as they industrialize and expand their infrastructure. Food prices, in their opinion, have also been affected by economic development, with the composition and volume of food intake changing as per capita income in these economies rises, generally resulting in a shift away from grains towards higher protein foods such as livestock and dairy, which have high resource footprints. Also, weather-related disturbances (i.e., droughts, floods, and cyclones) have boosted the prices of numerous agricultural commodities over recent years. The imposition of export bans (often in response to food security concerns) has also contributed to global supply shortages of some food stocks at times.

However, strong voices focus on the role played by the growing presence of financial investors in commodity markets (Figure 2.40). “With the ongoing financialisation, the ways of trading commodities and investing in them attracts new investors, mostly originating from financial markets. This fuels the transformation of the commodity markets even further. Combined with the changes and

turbulence in the world economy it may affect the stability of commodity markets.” (Zelazny, 2016, p. 33). Since 2005, trading of commodity futures and options has risen faster than any other sector of the global listed derivatives markets (Acworth, 2016). After equity derivatives, commodity derivatives recorded recently the highest increase in volumes.

Figure 2.40. Volumes of commodity options and futures (B of contracts)



Source: Based on: Acworth (2016).

The prevailing position of financial speculation in the commodity market has generated a lively debate about ways financialization, and financial investors distorting commodity prices (Cheng & Xiong, 2013).

Financialization of the public funds (state)

States and public industries become also increasingly dependent on financial markets. Rating agencies provide scorecards for governments, not only national governments, but also local ones. States debts are evaluated in the same way as commercial companies. Also, the management of public and semipublic institutions became more akin to private firms. For the last decades, financial actors, state administrations, professional and local government associations as well as consultancies have jointly pushed in this direction. Financialization, on the one hand, changes the organizational culture of local governments, and on the other,

encourages moving towards more sophisticated techniques, such as derivatives instruments, to manage interest rates and risk, or reconfiguring the governance of municipal entities into private or public-private partnerships to capitalize on future income streams from public services and utilities.

Driven by financialization municipal debt management became a response to fiscal constraints and financial market euphoria (Deruytter & Möller, 2019). The spread of deeply financialized New Public Management and of the domination of financial narratives, practices, and measurements is not limited to government institutions, but is also apparent in the working of other public authorities. It plays a key role also in the newly commodified sectors such as education, health care, and social housing. Even academic management is often controlled by financial metrics, measurements, and increasingly also narratives. The consequences are mostly negative: “less professional autonomy, more administrative chores, more standardization and less academic exchange” (Engelen, Fernandez, & Hendrikse, 2014).

Social issues of financialization

Some of the effects of financialization have been highly detrimental to significant numbers of people around the globe (Epstein, 2005). There is a feeling that both the economy at large and daily life have become more financialized (Aalbers, 2019). Consequently, the contemporary discussion on financialization is interdisciplinary. Apart from being rooted in the discipline of economics and finance, it also takes place in the field of sociology, political science, psychology and even ethics (Gruszecki, 2012). This means that indirectly (through economic processes) or directly (e.g., through changing habits, mentality, value system), financialization affects the everyday life of not only entrepreneurs but also of the households. “Many of the financialization protagonists suggest or explicitly argue that a great deal of work within their discipline or subdiscipline for too long has either ignored finance or presented an outdated view on the role of the financial sector in contemporary capitalism.” (Aalbers, 2019).

Housholds' income stagnation

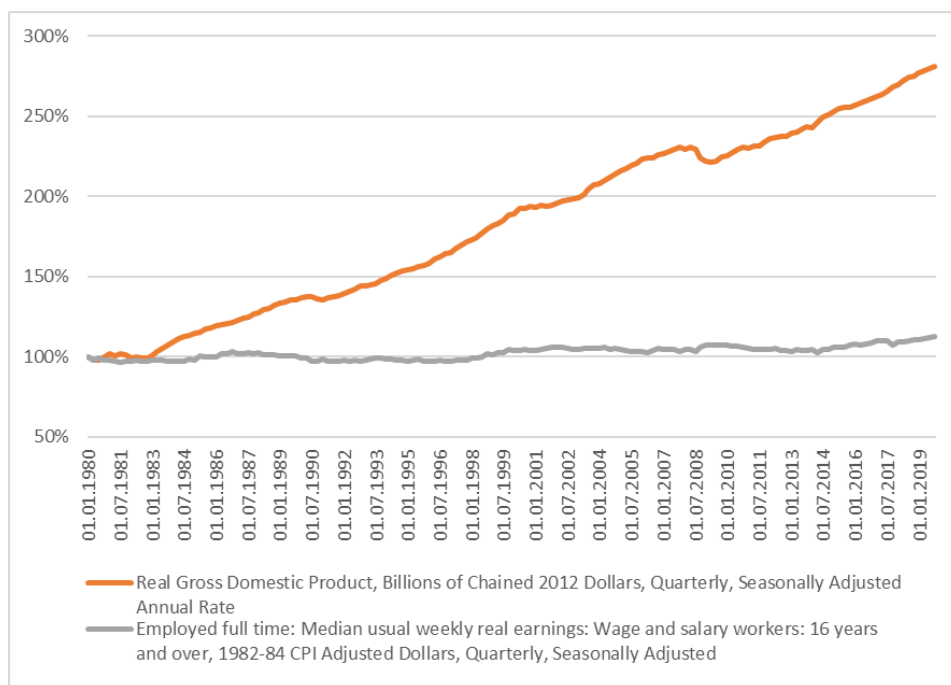
Considering the widespread marketization of economic relations, the employee is becoming increasingly only a party to the market contract based on the relationship between supply and demand in the labor market. The employee be-

comes human capital, an investment. The employer, however, concludes an employment contract relying mostly on the effectiveness and the efficiency parameters. Two key phenomena, in particular, become the consequence of dehumanization of the labor market, caused largely by its financialization:

- higher wage growth for employees or investors in the financial sector,
- increasing social stratification.

The analysis of historical data on the remuneration of manual workers in the nonfinancial sector illustrates the huge disproportion to the economic growth driven by their work (Figure 2.41).

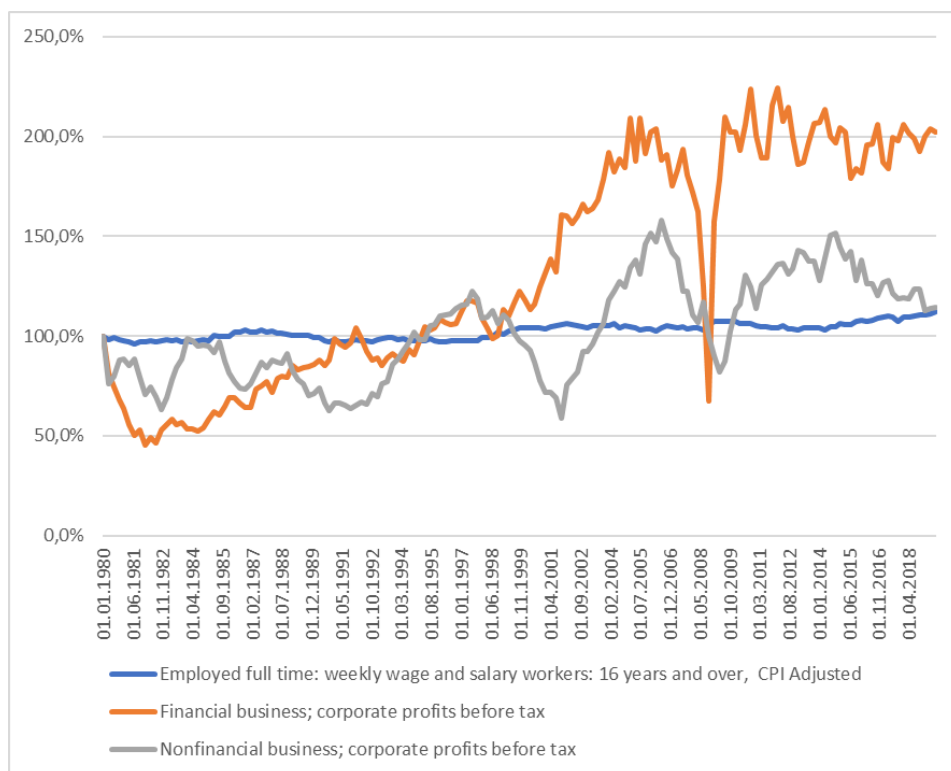
Figure 2.41. Dynamics of employed full-time workers weekly wage and salary vs. GDP



Source: Based on: Federal Reserve Bank of St. Louis (n.d.-b).

It can even be said, based on the example of the US economy, that the wages of this social group have remained almost unchanged for several decades. Therefore, employees of the nonfinancial sector have very limited contribution to the effects of their work. Equally significant is the comparison of the growth rate of employees' remuneration with the income of enterprises (Figure 2.42).

Figure 2.42. Dynamics of financial and nonfinancial business profits against dynamics of employed full-time workers weekly wage and salary



Source: Based on: Federal Reserve Bank of St. Louis (n.d.-b).

As it can be seen (Figure 2.42), the pace of profit growth in the financial sector is much higher than in the nonfinancial sector. It is because the share of national income accruing to financial institutions and holders of financial wealth is getting significantly higher in the last decades than it used to be before. Even worse, it can be said that since the 1980s, the wages of blue-collar workers have increased much slower even than the profits of nonfinancial companies. Therefore, it should be expected that the added value of the economy goes to a large extent to employees of financial institutions and owners of financial assets.

Wealth inequality and social stratification

For the last decades, the developed world has witnessed also a dramatic increase in wage inequality. Financialization engines inequality through various channels, including macroeconomic policies. For example, quantitative easing and low, if

not negative interest rates have fueled credit and asset price bubbles, while fiscal spending cuts have adversely affected those depending on government assistance. It is evident, that inequalities have increased mostly due to financialization. The rich benefit from more rentier options and government efforts to protect the value of financial assets. The main gains of financialization tend to go to those who most successfully speculate at low cost, and to the asset management and investment firms involved so that the increase in inequality was mainly driven by the increase in the volume of stocks traded in national stock exchanges and by the volume of shares held as assets in banks' balance sheets.

Consequently, the financialization enriches mostly the reach ones. As yields on long term securities plunge and asset prices surge, very low-interest rates encourage companies, private equity, hedge funds and the rich to borrow even more to invest in financial assets, sending prices even higher. Finance also increases inequality through greater wealth concentration thanks to exclusive wealth management services for rich clients who get favored access to specialized services and structured, high yield products. Corporations and wealthy individuals use the best available professional services for tax avoidance and evasion, often facilitated by banking secrecy. Private banking employs top fund managers to manage the wealth of rich clients, offering high returns while ordinary depositors have to accept modest interest rates on their deposits. However, rising debt and equity transactions have generated lucrative fees for bankers, traders, fund managers and private equity investors, mainly benefiting market players with means. With finance capturing more profits than manufacturing, unlike before, working for finance now secure much higher incomes compared to others.

Nevertheless, financialization drives the poor to be even poorer. The poor have less, but also costlier access to finance. Stagnant or declining wages have imposed greater indebtedness on the poor. The idea of "financial inclusion" presumes that everyone successfully manages their involvement in increasingly complex financial markets, and that light regulatory touches and "financial literacy" effectively restrict predatory financial practices. But unfortunately, with real wages for many not rising for decades, increased financial inclusion has meant greater indebtedness for many of them. Also, technological innovations in finance have had ambiguous consequences. The higher computing capacity has enabled financial innovations that enrich investors, with economies of scale, at the expense of the less tech-savvy and less well informed.

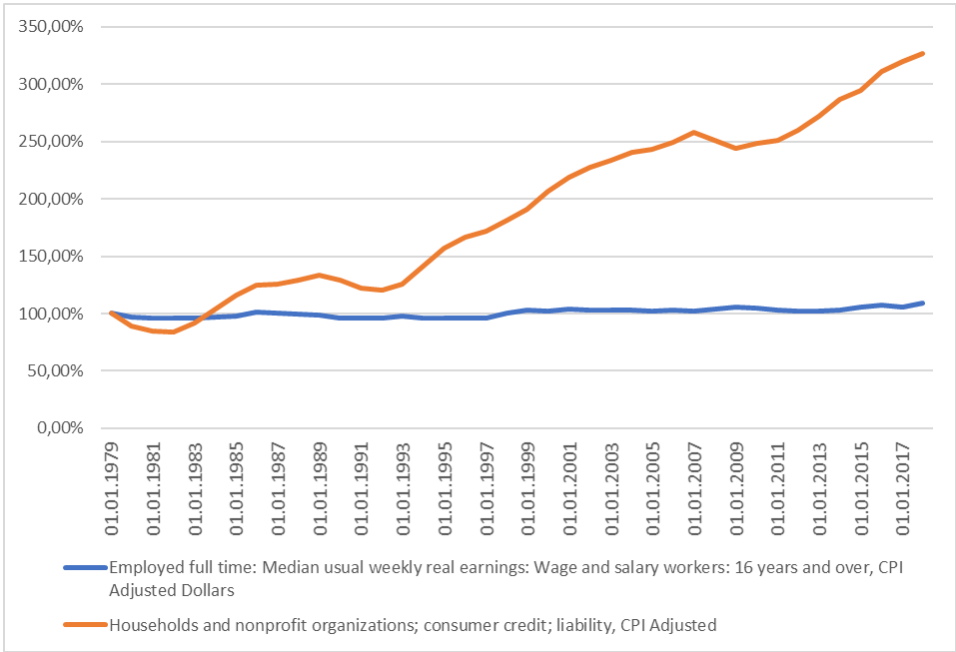
The consequence of the above mechanisms is the economic stratification of societies. Currently, just over 2,000 of the world's billionaires have more wealth

than the 4.6 billion people who represent 60% of the planet’s population. The number of billionaires has doubled in the last decade (OXFAM International, 2020). The three richest people in the US – Jeff Bezos, Bill Gates, and Warren Buffet – own more than the bottom half of the country combined (*The Guardian*, 2018) The impact of finance on the increase of the top 1% of the population is around 40%. At the same time, finance contributed 48% of the rise in the share of the top 0.1% of the population, whereas service to business and other sectors each contributed just under 23%, and entertainment only 8%. When moving into the top 0.01%, he figured out, that finance made even a 57% contribution to the increase in the share of the working rich (Godechot, 2016).

Private debt increase

Under the pressure of consumption-driven economic growth, households are encouraged not to save, but rather to increase consumption. Moreover, financial institutions make sure that in the face of insufficient own income, the client can always count on a loan (Figure 2.43).

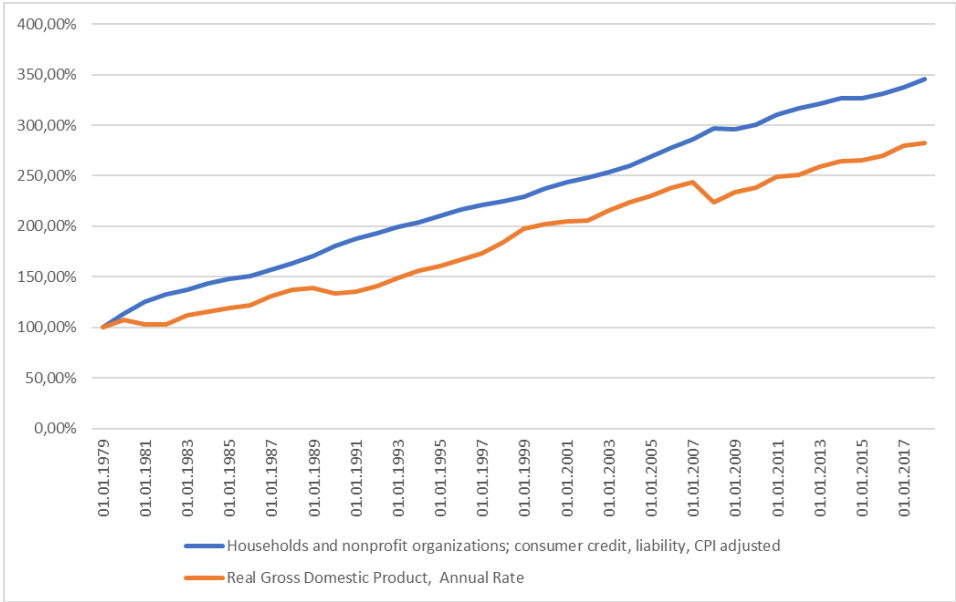
Figure 2.43. Dynamics of weekly USA real earnings vs. dynamics of households and nonprofit organizations indebtedness



Source: Based on: Federal Reserve Bank of St. Louis (n.d.-b).

Driving consumption through debt is dangerous from the social point of view, but also distorts the perception of economic growth due to the financialization of the measure of this growth itself, which is the GDP index (Figure 2.44).

Figure 2.44. Dynamics of USA GDP index vs. dynamics of households and nonprofit organizations indebtedness



Source: Based on: Federal Reserve Bank of St. Louis (n.d.-b).

Despite the systemic neglect of the impact of debt in the measurement of economic growth, a comparison of the growth rate of household debt (in gross terms) with the growth rate of GDP indicates the low effectiveness of this risky strategy. Based on the data on the American market, a much greater increase in household debt than in GDP can be observed.

Real estate as a social value or market commodity?

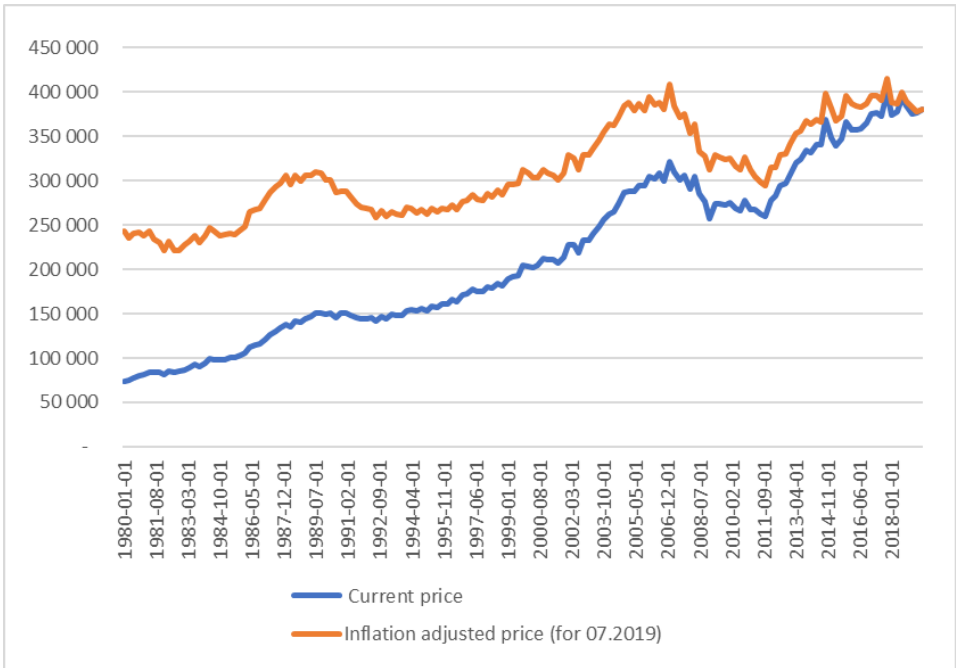
Real estate in the social approach is a multidimensional category. Among the numerous classifications of real estate as economic good, the division resulting from the difference between the investment and consumption approaches is of key importance. Real estate, as an object of consumption, may satisfy fundamental human needs. It is to guarantee him safety and a certain standard of living. The buyer of an apartment or house to live with his family analyzes the problem in the long term. For the user of such a property, changes in the market valuation

of the property will also be of secondary importance, as they largely affect its property status only in a hypothetical manner. Even a large increase in value does not have to increase the effective wealth of its user, especially in a situation where the systemic upward trend is subject to the prices of other real estates, which could potentially become his new place of residence.

The attitude of a financial investor operating on the investment real estate market is completely different. Therefore, the investor is free from limitations resulting from his and his family’s living issues. In his case, the property is primarily traded or leased. Changes in real estate prices become for him a potential source of profit and risk. Market rental prices also enable achieving a specific rate of return.

A spiral of debt, along with a culture of meeting needs based on future, not current incomes, causes some disturbances in the real estate market. They mainly include rising prices and their volatility. This is evidenced by selected statistical data on the American real estate market. First, they refer to the average real estate price (Figure 2.45). Over the period 1980-2019, the prices of flats in nominal terms increased almost six times. After adjusting for the inflation rate, the increase in the given period amounts to about 56%.

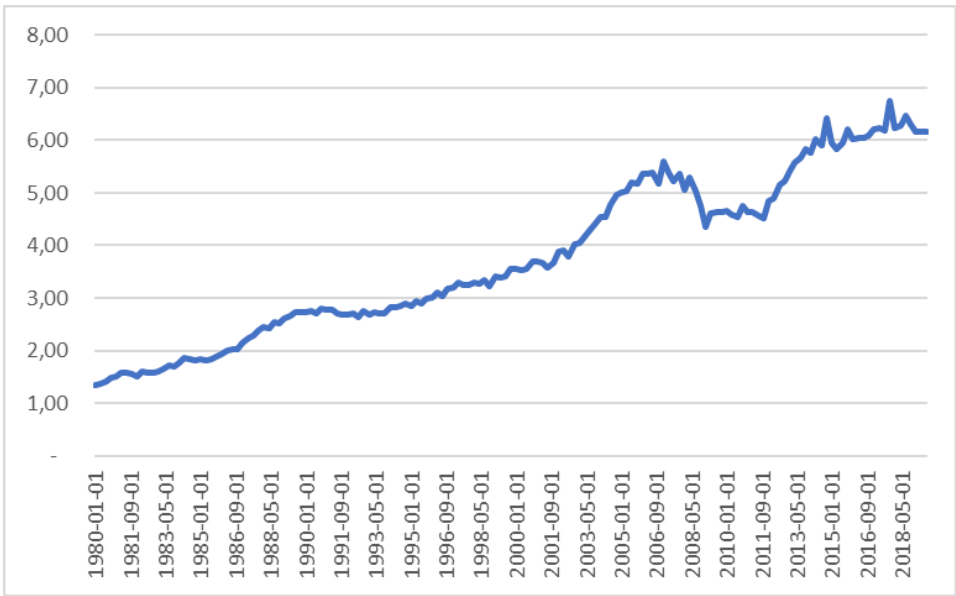
Figure 2.45. Average sales price of houses sold for the United States



Source: U.S. Census Bureau and U.S. Department of Housing and Urban Development (2021).

As a result, given the previously demonstrated long-term stagnation of real wages outside the financial sector, for almost 40 years the theoretical working time required to purchase real estate increased 4 times, from about 1.5 years to over 6 (Figure 2.46).

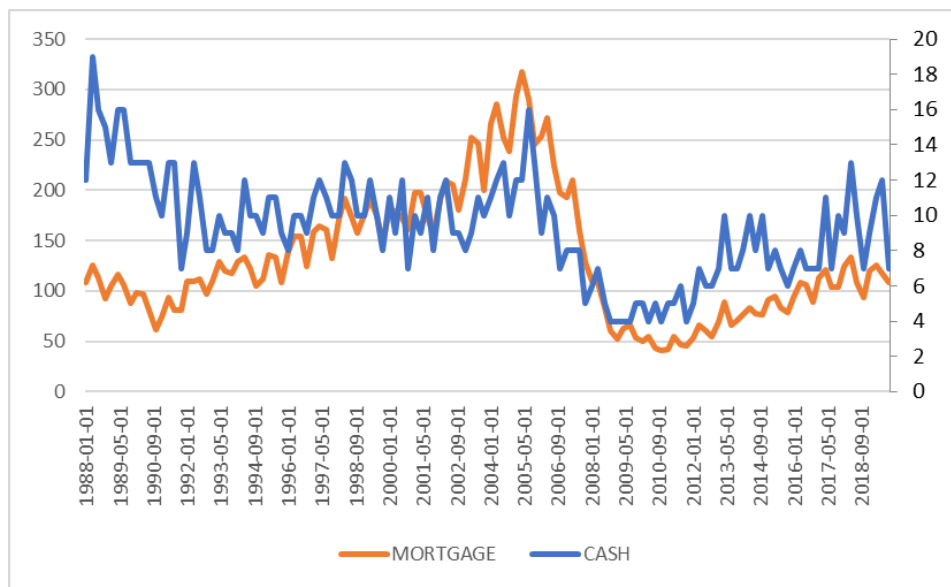
Figure 2.46. Average sales price of houses to average yearly earnings



Source: U.S. Census Bureau and U.S. Department of Housing and Urban Development (2021a).

In practice, this means that financing the purchase of real estate from own resources has become unavailable. Even governments have played a significant role in encouraging households towards debt-driven expenditure pushing them in a process of financialization of daily life. The state increasingly pursues policies that transfer the responsibility for social welfare from the state to individuals' and households' (Glover, 2010).

Figure 2.47. Houses sold by type of financing: Conventional and cash purchase (thousands of units/quarter)



Source: U.S. Census Bureau and U.S. Department of Housing and Urban Development (2021b, 2021c).

The number of houses financed traditionally (mortgage loan) is many times higher than of those paid by cash (Figure 2.47). Also, the changes in the number of homes purchased with credit are subject to strong fluctuations due to the onset of the financial crisis. In mid-2006 house prices in the United States started to decline. In the period 2006-2009, the number of flats purchased with a loan decreased almost 6 times and currently remains at the level from the beginning of the 1990s. At the same time, the number of flats purchased for cash decreased approximately 2.5 times, currently reaching the pre-crisis level of sales.

Threats of financialization – against sustainable development

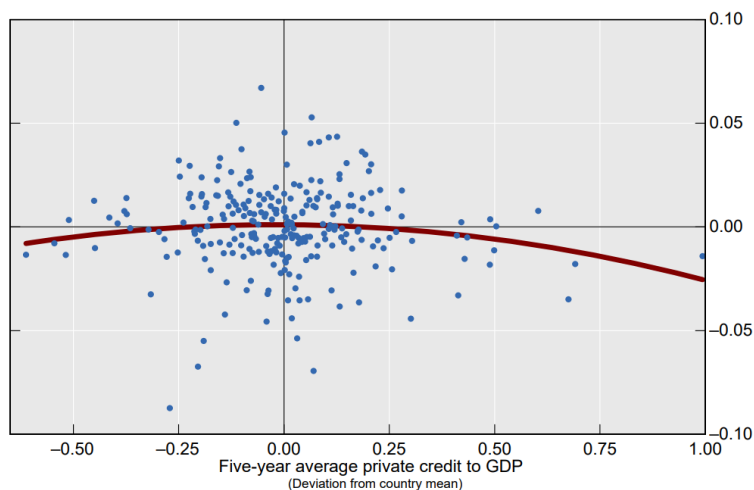
Financialization vs. economic growth

One of the principal conclusions of modern economics is that finance is good for growth and an economy needs intermediation to match borrowers and lenders, channelling resources to their most efficient uses. Researchers established a con-

vincing causal link running from finance to growth. Observing many drawbacks of financialization, the question should be addressed, what is the real impact of the size and growth of the financial system on productivity growth at the level of aggregate economies. As long as we expect, that at low levels a larger financial system goes hand in hand with higher productivity growth, at the same time, we can suspect, that there comes a point where more banking and more credit are associated with lower growth. Some indices show that indeed the relation between financialization and GDP is not unambiguous and even faster growth in finance could be bad for aggregate real growth.

The first question could be asked, whether private credit is bad for economic growth. The result in Figure 2.48 presents the impact of five-year average private credit to GDP at the five-year average GDP-per-worker growth. The relationship is not monotonic. That is, at low levels of credit, more credit raises trend growth. But there comes a point where the additional lending and a bigger financial system become a drag on growth.

Figure 2.48. Private credit to GDP ratio and growth. Five-year average GDP-per-worker growth

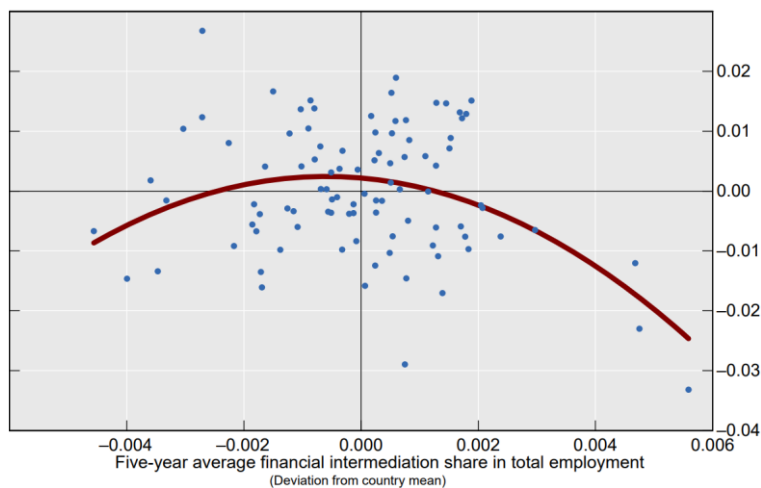


Note: Deviation from country mean over the period 1980-2009.

Source: Cecchetti & Kharroubi (2012, p. 3).

Also, the relationship between growth and the financial sector's contribution to employment is convex (Figure 2.49). At low levels, an increase in the financial sector's share in total employment is associated with higher GDP-per-worker growth. But there is a threshold beyond which a larger financial sector (in terms of employment) affects negatively productivity growth.

Figure 2.49. Financial sector share in employment versus growth. Five-year average GDP-per-worker growth

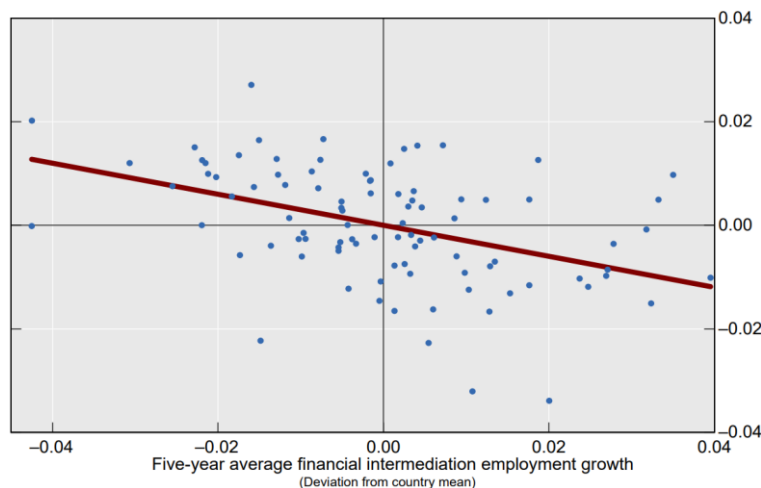


Note: Deviation from country mean over the period 1980-2009.

Source: Cecchetti & Kharroubi (2012, p. 8).

And finally, the impact of the five-year average growth in the financial sector's share in total employment at the five-year average GDP-per-worker growth has been investigated (Figure 2.50).

Figure 2.50. Financial sector growth and productivity growth. Five-year average real GDP-per-worker growth



Note: Deviation from country mean over the period 1980-2009.

Source: Cecchetti & Kharroubi (2012, p. 11).

The result is quite striking: there is a very clear negative relationship. The faster the financial sector grows, the slower is pace of the economic growth.

Referring abovementioned findings two key conclusions could be drawn. First, financial sector size has an inverted U-shaped impact on productivity growth. There is a point where further expansion of the financial system can reduce real growth. Second, financial sector growth is found to be a drag on productivity growth. Our interpretation is that because the financial sector competes with the rest of the economy for scarce resources, financial booms are not, in general, growth-enhancing. This evidence, together with recent experience during the financial crisis, leads us to conclude that more finance is not always better (Cecchetti & Kharroubi, 2012).

Financialization of GDP – dysfunction of reference measure

To make financialization manageable, it must be measurable. Applied measures should take into account primarily the scale of financialization (total size of financial assets, employment in the financial sector, financial incomes in industry and so on) and secondarily, its impact on economic growth. The most commonly used measures considering the above-mentioned aspects of financialization refer to GDP aggregate. It should be noted, however, that GDP has undergone a radical transformation in recent decades due to the way of how financial activities are treated in the national accounting framework (Assa, 2016).

The direction of GDP evolution can be described as the **financialization of GDP**. It leads to an excessive increase in the total value of GDP, as well as an increase in the contribution of the FIRE sector. That could pose the key question, whether the concept of Gross Domestic Product (GDP) still fulfils its role as the most objective, stable and reliable measure of economic growth. The strong financial contribution to the GDP has given rise to a lively discussion of possible implications for various aspects of political and economic debate. An interesting voice in the discussion was raised by Assa (2016) pointing at three fields of the debate:

- breakdown of Okun's Law,
- the Great Moderation phenomenon,
- GDP as a misleading predictor.

Okun's Law establishes a relationship between the rate of growth (GDP) and the changes in the rate of unemployment. On average it could be said, that a 1% reduction in economic output corresponded to a half a point increase in the un-

employment rate (Wen & Chen, 2012). The validity of this law has recently been questioned. Basu and Foley (2013) point out that during the 2007-2008 crisis a significant anomaly affecting this law could be observed. The U.S. unemployment rate in 2009 increased twice as fast as conventional models would have predicted given the drop in output. Also the recovery of the real GDP in the second quarter of 2009 “had even less impact on the aggregate unemployment rate than in the previous two jobless recoveries” (Basu & Foley, 2013, pp. 1077-1106). The debate about the fallacy of Okun’s law takes into account numerous and various issues. One of them refers to the GDP as a reference measure. The growth in financial services leads to overestimating real output at the aggregate level, which explains part of the apparent breakdown of Okun’s Law. The incomes of the FIRE sector have either a negative influence or no significant influence on employment in their sector. Including FIRE in the GDP weakens the overall links between the GDP and employment.

Another debate about the GDP concerns the so-called “Great Moderation”, that is reduction in the volatility of the economic output (measured by GDP) which began around 1994. It could be explained by a structural decline in the variance of shocks and a narrowing gap between economic growth rates during booms and recession (Kim & Nelson, 1999). Other researchers focus on the shrinking contribution of non-technology shocks to output volatility and stabilizing impact of low inflation (Galí & Gambetti, 2009). However, recent studies question the existence of this moderation and claim, that volatility since the mid-1990s has only moved from shorter cycles (and higher frequency) to longer ones (and lower frequency) (Crowley & Hallett, 2014). Also here, both parties use standard GDP to define volatility. The problem is, that the financialization of the GDP has reduced aggregate volatility. During economic cycles, the FIRE sector’s ups in the “value-added” systematically compensate for simultaneous downs in real sectors. It leads to the conclusion, that “Great Moderation” is ultimately statistical fiction (Assa, 2016).

One of the basic expectations of economists is the ability to forecast the future. An analysis based on a large number of indicators is associated with the inevitable modelling errors. Quite often, therefore, analysts try to use synthetic measures of high informative importance. Undoubtedly, the GDP can be considered as one of them. However, empirical studies show that the GDP-based observations proved to be poor indicators of the upcoming declines in demand and employment. The GDP may suffer from a statistical bubble, recognizing income from loans and debts as if it would increase demand for goods and services instead of being detrimental to demand and causing its instability.

Conclusions

The concept of financialization is multi-dimensional. It can refer to the growth of the financial sector as a whole, or of financial market activities only, or go beyond the finance sector to the financialization of nonfinancial institutions, firms or households. Financialization is considered as one of the most important processes limiting the sustainable development of economies. Institutional changes, motives and incentives in the financial markets distort the economic rules and create destructive bubbles. As shown by the global financial crises, the distribution of costs and benefits turned out to be asymmetric. Financial institutions conducting excessively risky activity are in the end bailed out by public funds on the account of the regular taxpayers. Moreover, the consequences of crises, such as a decline in the economic growth rate or even a recession, unemployment or deterioration in living standards, were often borne by entities completely not related to the financial sphere.

Also, the policies of governments aimed at fighting the crisis turned out to be quite controversial, often exacerbating the situation or acting in favor of financial institutions or financial investors rather than the real victims (Marszałek, 2012).

A separate problem is a phenomenon of “financial illiteracy”. Households are exposed to making complex financial decisions without professional knowledge. Following the destructive herding behavior, they become victims of speculative bubbles. Herd behavior of the society seems to be, on the one hand, a consequence of the information gap and information asymmetry, but on the other, it may be convenient for financial markets, and thus stimulated by them on purpose.

Therefore, the question is, of how – if at all – to discipline the activities of financial institutions and markets without giving up the benefits they provide to the market economy. The conviction about the unconditionally beneficial effects of the financial sector’s growth should ultimately be considered unfounded. More finance does not necessarily mean higher and sustainable economic growth. Moreover, it can be shown that too much finance could be a drug to the economy and society.

KEY TERMS

Finance, financialization, financial sector, the real economy, economic growth, inequality

SUBCHAPTER SUMMARY

Following the classical economics paradigm, finance should be subordinated to the real economy. The **servile nature of finance** makes them only a manifestation of the economic activity of enterprises and households taking place in the real sphere. In such a model, the financial sphere of the economy should, on the one hand, be efficient enough not to limit activity in the real economy, and on the other, it should be cheap and invisible enough not to burden the real economy with its activities and not consume profits generated in the real economy. However, the deterministic approach could be considered, in which finance becomes the cause and not the effect of economic processes. Instead of just a reflection of real processes, finance becomes a tool, an instrument for achieving goals, including those that are not purely of a monetary nature. The **deterministic approach** contradicts the statement that the superior function of the financial system is to participate in the creation of a commonly accepted means of making transactions (money, purchasing power) and to facilitate its mobility between nonfinancial economic entities.

Financialization is one of the most important processes limiting the sustainable development of economies. Despite the increasing significance of finance in the market economy, the perception of that new phenomena is not unambiguous. Theoretical discussion over that idea oscillates between acceptance of natural evolution of market economy by growing importance of financial sector on the one hand, and warnings of the destructive role of finance in economic, social and ethical aspects of sustainable development on the other. Frame schedule of the discussion over financialization should comprise of pursuing the answers for a few key questions: what are key drivers of financialization, what are its key symptoms, what is its impact on the real economy and finally how to cope with it.

DISCUSSION QUESTIONS

1. What should be the relation between the real economy and finance?
2. How do you understand the idea of financialization?
3. What are the symptoms of financialization?
4. What are the measures of financialization?
5. What is the impact of financialization on the real economy and social life?

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2.2.3. Inequality

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LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- understand the basic theoretical concepts of inequality,
- distinguish types of inequality,
- use methods of measuring income inequality,
- recognize the consequences of income inequality for the economy and society,
- recognize interfaces with SDG 2030.

Introduction

In modern society, countries, states strive for the improvement of society, the quality of life. One of the main goals is to reduce social exclusion and increase

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people's well-being. Thus, one of the most important indicators of living standards can be distinguished – income. It is widely acknowledged that income inequality has tended to increase over the past two decades. The prevailing opinion is that growing inequality threatens economic growth and financial stability, and is one of the biggest threatening trends in the world economy (Royuela, Veneri, & Ramos, 2019; Lee & Son, 2016). According to Stockhammer (2015), the recession that began in 2008 was the worst economic crisis since the 1930s, and the growth of income inequality has been one of the biggest social changes since the 1980s in OECD countries. Of course, income inequality may have an impact on other aspects as well, i.e., lead to higher levels of poverty, crime, emigration, inequality of consumption, poorer health care or education conditions, psychological problems of individuals or financial and political instability. It is pointed out that income inequality prevails not only in developing, but also in developed countries, and therefore, this social phenomenon is one of the most pressing global problems. Thus, in understanding the importance of this phenomenon, its constant increase, and in order to reduce it, it is important to know the reasons for the change in income inequality.

The concept of inequality and the factors influencing it

The term “inequality” means that it is not equal (Latin: *in-aequalis*). Therefore, when defining the concept of inequality, it is appropriate to single out and select the elements to be studied, as there may be gender, race, opportunity or income inequality. Research on economic topics usually deals with social and economic inequalities (Antras, de Gortari, & Itskhoki, 2017; Hill Collins, 2012; Cribb, Hood, Joyce, & Keiller, 2017; DiMaggio & Garip, 2012). Social inequality is linked to restrictions on property, voting rights, freedom of expression and assembly, access to health care or education, and employment. In other words, these are differences in the position of social groups in the hierarchy of society, which are usually determined by education, kinship, occupation, and so on. Economic inequality is the inequality in the distribution of income (population income differentiation) and expenditure of the country's population, i.e., the difference in their size between different social strata and groups in society.

The theoretical foundations of population income distribution were developed by classical school economists Say and Ricardo, who singled out the functional distribution of income among the factors of production. A significant contribution to the development of a modern theory of income distribution, redistribution

and inequality belongs to economists Atkinson (1975-2011), Bourguignon (1982-2000), Gottschalk (1995-2005), Lambert (1993-2007), Smeeding (1997-2008), etc. (Wesley & Peterson, 2017). The first calculations of global inequality were made in the early 1970s (Berry, Bourguignon, & Morrison, 1983). Trends in global inequality and the causes of change have been studied by Atkinson (1998), Ravallion (2001), Bresler (2000), Lee and Son (2016), and Rakauskienė et al. (2017), etc.

The concept of income inequality cannot be unambiguously defined. It is also not clear what degree of income inequality is acceptable to society. According to Skučienė (2008), the normative aspects of income inequality stand out very well in the definitions describing the equal distribution of income:

- liberal definition: each individual receives an amount of income appropriate to his/her work;
- minimum definition: each individual can meet recognized minimum needs;
- egalitarian definition: each individual has exactly the same amount of income;
- group definition: representatives from different social groups have on average the same amount of income.

Also the approach to income inequality can be twofold – conservative and radical. According to the conservative approach, the system rewards the most deserving individuals for their efforts and work. In this case, maintaining the status quo in society protects the interests of everybody. According to the radical approach, the powerful people make use of force, violence, discriminatory tax laws and other methods of increasing their assets.

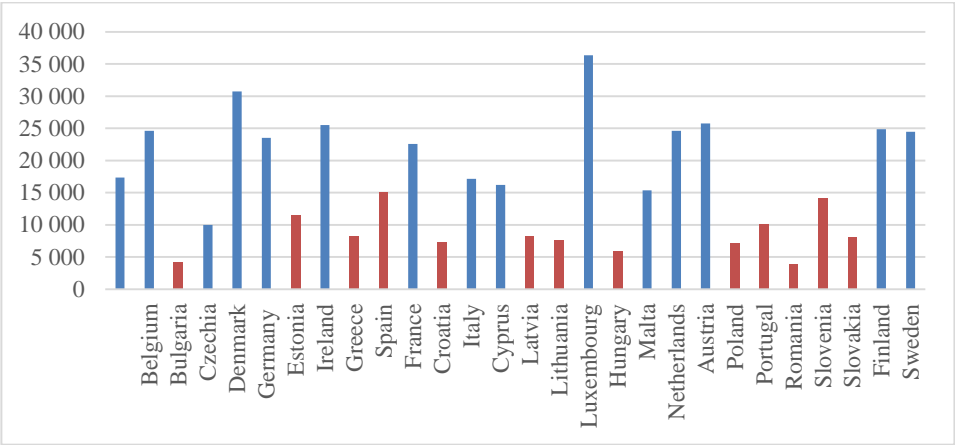
Income inequality can be defined as a phenomenon that shows the unequal distribution of income among the population, among individuals in the economy (Skučienė, 2008). Income inequality refers to differences in income between individuals, households, countries, or any other identifiable combination of entities. Due to the unequal distribution of income, when some entities receive more income while others receive less income, income inequality is associated with negative consequences, as the entities who receive less income are no longer able to acquire as many goods or services as they could before the increase in income inequality (Charles-Coll, 2011). It is not possible to name exactly what income inequality is in one answer and there is no uniform definition of income inequality, the diversity of approaches prevails. The concept of income inequality is presented in Table 2.5.

Table 2.5. The concept of income inequality

Authors	Definition
Peters & Volwahren (2017)	Income inequality is an important socio-economic indicator that characterizes the country’s socio-political situation and level of economic development compared to other countries of the world
Skučiene (2008)	Income inequality – income differences between individuals in the economy
Charles-Coll (2011)	Income inequality is a phenomenon that reflects differences in income between individuals, households, countries, or any other identifiable combination of entities
Fox (2014)	Income inequality is a phenomenon that reflects the unequal distribution of income among the population
Ciegis & Dilius (2018)	Income inequality is defined as differences in income in the economy between individuals, persons, households, countries, or any identifiable combination of entities

Figure 2.51 shows that income inequality exists and varies across EU countries.

Figure 2.51. Median equivalized net income (in euro) in EU countries in 2019



Source: Based on Eurostat data: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_di03&lang=en

Figure 2.51 shows that the average net income of EU countries in 2019 reaches more than 17 thousand euros. Belgium, Germany, Denmark, France, Luxembourg, the Netherlands, Austria, Finland and Sweden exceed the EU average. The lowest volumes of net income in 2019 were in Bulgaria, Hungary and Romania.

Income inequality is influenced by many factors, some of which are affected by the laws adopted in the country, the activities of the government, others – by the

personal characteristics, abilities and inheritance possibilities of an individual. Income is unevenly distributed among individuals for a number of reasons, such as differences in individuals' assets (physical and financial assets and human capital) and differences in demand, demographic factors (household size and composition, age), geographical factors (regional economic characteristics, natural or climatic conditions), just luck or chance (Zabarauskaite & Blažiene, 2012). Balvočiūtė (2014) states that people are different, their life goals, inspiration, needs and opportunities are different. Differences in people's incomes depend on different people's skills, knowledge, priorities, goals, abilities, and other factors. Dubauskas (2013) states that income inequality is also determined by unequal abilities of individuals, their education, knowledge, different working hours, work productivity, unequal working conditions. Income levels are also influenced by family background, personal ties, political influence, and possibly acquired monopoly power in the labor market. Wage differences between counties are determined by geographical location, number of business objects, competitiveness of the labor force (Beržinskienė & Raziulytė, 2013).

Blažiene and Zabarauskaite (2011) distinguish four main groups of factors that determine the income of the population: economic, demographic, geographical and social factors. The authors distinguish two approaches to these factors:

- 1) independent of the individual – the general economic, social, demographic, geographical situation of the country, and
- 2) directly related to the individual: socio-economic – the main source of income, education, employment, wealth; demographic – household size and composition, age, gender of its members; geographical – place of residence, etc.

Meanwhile, Rakauskienė et al. (2017) divide the factors determining economic inequality into three broad groups: economic, socio-demographic and psychological factors. The authors state that some factors affect inequality directly, others – indirectly, and others form the medium, circumstances for the mentioned factors. Some factors can exacerbate inequality, others – reduce or even eliminate it.

Ciegis and Dilius (2018) argues that the increase in income inequality is exacerbated by the following factors: political instability, income redistribution, globalization, financialization, technological progress, and international trade. Globalization is singled out as a major factor in increasing income inequality (Ciegis, Dilius, & Martinaitytė, 2016; Jaumotte, Lall, & Papageorgiou, 2013). It has the greatest negative impact on income inequality in developing countries. International trade and foreign direct investment are driving technological progress, which is increasing the need for higher-skilled employees, leading to growing

income inequality. The authors also single out the fiscal policies pursued by the institutions, which can contribute to reducing income inequality. Rakauskienė et al. (2017) state that inequality arises for the following reasons:

- different income levels of social groups,
- unequal degree of adaptation of social groups to new living conditions,
- regional, territorial characteristics that influence the solution of socio-economic issues,
- unequal distribution of property and efficiency of its use,
- demographic factors,
- gender.

The following factors that determine income inequality in society are most often identified in different scientific sources (García-Peñalosa & Orgiazzi, 2011):

1. Differences in physical and mental abilities. These differences can be innate and acquired, i.e., determined by the social and economic environment. They directly or indirectly determine the place of a person as an economic entity, person's self-determination, opportunities to find and work in one or another job, etc.
2. Investment in human capital. Accumulated human capital is an important factor in an individual's income and employment prospects, and the acquired knowledge and skills not only lead to higher wages, but also create opportunities for more attractive job and reduce the risk of unemployment.
3. The amount of work and its nature. Income differences are formed by people's different attitudes to work, different working hours and their specifics.
4. Inequality of disposable assets. Differences in accumulated and inherited assets play a significant role in income inequality. Accumulated assets can be supplemented by inherited family property, which further exacerbates property inequality.
5. Risk. More risky savings investments often yield higher returns than bank interest, however, investments in risky projects can also be unprofitable.

According to Balvočiūtė (2014), the income differences of the population are increasing because of the following reasons:

- the link between disposable income inequality and its growth is not reliable and obvious,

- income growth is slowing due to excessive social costs,
- active use of social measures helps to increase income,
- higher income inequality (excluding taxes and social transfers) encourages an increase in social costs,
- awareness of poverty helps to avoid social problems, encourages investment in human capital.

Many studies note that growing income inequality (hourly wages) has been one of the main factors that triggered the increase in economic inequality in the world over the past decade. The growing hourly wage differences have been driven by the growing demand for skilled workers and the relatively small number of such workers. The growth in demand for skilled workers, in turn, was largely driven by the development of information technology innovations in the last decades of the last century and the beginning of the 21st century. In addition, emerging innovations in the production process (new technologies, organizational changes) have increased the productivity of skilled workers more than unskilled ones. This, in turn, has led to wage growth in these groups.

OECD researchers identify the following as the main causes of global economic inequality over the past decade:

1. Changes in the population structure related to the growing number of single households in the overall household structure.
2. Growing differences in pay for work between full-time workers in many OECD countries, driven by globalization, technological change and the policies pursued by labor market institutions.
3. Growing inequalities between income from capital and income from the self-employed.
4. The growing number of people working on short-term and part-time contracts. Research also shows that the degree of economic freedom has a significant impact on the extent of economic inequality. The greater the economic freedom, the better the conditions are in place for economic inequality to grow (Clark & Lawson, 2008).

Zabarauskaite and Zabarauskaite & Blažiene (2012) singled out different factors that increase or decrease inequality in different periods of the economic cycle: periods of economic ups and downs (Table 2.6).

Table 2.6. Factors of income inequality in the periods of economic ups and downs

Periods of economic ups	
<i>The increase in inequality is determined by:</i> <ul style="list-style-type: none">• increased investment opportunities,• real wage growth,• impact of taxes	<i>The reduction of inequality is determined by:</i> <ul style="list-style-type: none">• decrease in work,• increase of the minimum monthly salary,• the impact of taxes,• pursued social policy
Periods of economic downs	
<i>The increase in inequality is determined by:</i> <ul style="list-style-type: none">– rising unemployment,– declining government spending on social security,– the impact of taxes,– decrease in wages	<i>The reduction of inequality is determined by:</i> <ul style="list-style-type: none">– decrease in real wages,– decrease in investment opportunities,– impact of taxes

Source: Zabarauskaite & Blažiene (2012, p. 111).

When the economy is on the rise, the wealthier population can spend more on investment, which will further increase their incomes and this will lead to an increase in inequality. However, as the investment of the wealthier declines during the economic downturn, inequality decreases. Rising real wages also increase inequality, as the wages of those on lower incomes do not grow as significantly as those on higher incomes. Meanwhile, raising the minimum monthly wage reduces income inequality as the incomes of the low-income population are rising. The impact of taxes also affects income inequality, it manifests itself in the same way, regardless of whether the economy is in an upturn or downturn stage. An increase in income and VAT taxes leads to an increase in inequality, and the income of the lower-income population is further reduced. However, the introduction of a progressive tax, the taxation of luxury goods, reduces inequality, because in this case the amount of income received is taken into account. The reduction of unemployment and the implementation of social policy also contribute to the reduction of income inequality. During the economic upturn, more jobs are created, employment opportunities increase, the income received by the state grows, therefore it can allocate more funds to social policy and reduce the poverty level. Meanwhile, when the economy is in a downturn stage, inequality is rising due to rising unemployment and declining government spending on social protection.

Balvočiūtė (2014) highlights the reasons why lower income inequality is very important in society:

- The unequal distribution leads to more social problems.

- The unequal distribution of wealth and income in the present will become unequal opportunities for future generations.
- Inequality of income and wealth contributes to inequality of freedom. People who invest in capital have more opportunities, more freedom than people whose income is made up of wages alone.
- Rising wealth and income inequality undermines democracy, and people with more resources can influence political processes.
- Income inequality destroys the community, causes jealousy, weakens the unity of society.

The attitude of the state and the measures it implements also have a significant impact on the increase or decrease of inequality. According to Lisauskaitė (2010), economic growth does not guarantee equal improvement for all people, for some people, the situation is improving significantly, while for others, the situation is only getting worse. The state must monitor the change in inequality, analyze not only the average changes in income and consumption, but also their distribution among the richest and poorest groups of society, as growing wealth inequality and social differences in the long run begin to undermine the country's economic development.

In summary, it can be said that differences in household income inequality occur for a wide variety of reasons. Most often, these differences are due to differences between individuals, different attitudes to work, family accumulated wealth, success. Factors of income inequality can be independent of the individual, when they are strongly influenced by success or pursued government policies.

Measuring income inequality

Income inequality is assessed differently by each person, it depends on the person's socio-economic status, gender, age. People with lower status associate economic inequality with opportunities for education, inheritance, and people with higher status – with skills and work. Older people are less tolerant of inequality than younger people, and income inequality seems much higher for women than for men (Skučiene & Kaminaite, 2017). The same income can have different meanings for different people, people's attitudes and needs are different, it is influenced by the country's economic development, the country's history, cultural level, public attitude, level of human education (Lisauskaitė, 2010).

Monetary income mainly determines the well-being of the population, work motivation, and the socio-economic situation of people and the political situation in society depend on them (Rakauskienė et al., 2017).

Income inequality has been analyzed by economists for many years, and many different methods and models have been used to calculate and evaluate it, and different indicators have been calculated and combined. As noted by Cobham and Sumner (2013), several well-known axioms are used to measure inequality, for the exact number of which there is no consensus among researchers. The most commonly cited are five axioms, the detailed expression of which was provided by Litchfield (1999) for information:

- *Pigou-Dalton transfer principle*. If the income of the poor is transferred to the rich, then inequality should increase, if the income of the rich is transferred to the poor, then inequality should decrease.
- *Independence of the income sample*. If each person's income changes by the same amount (e.g., by changing currency), then the inequality should not change.
- *Population principle*. Combining two completely equal parts of the population should not change the magnitude of inequality.
- *Principle of anonymity (symmetry)*. The magnitude of inequality is independent of any other personal characteristics other than their income.
- *Principle of division*. This principle requires that the inequality of the whole be consistently linked to its components. For example, if inequality grows between subgroups of the population, then overall inequality should also increase.

Income inequality can be measured using the following valuation coefficients and indices:

- Lorenz curve,
- Gini coefficient,
- Quintile income differentiation coefficient,
- Robin Hood index,
- Hoover coefficient,
- Atkinson index,
- Decile ratios and others.

Each of these indicators evaluates a certain aspect of income differentiation – the differentiation of the income of the population as a whole or the dispersion of a certain part of it. The simplest way to determine income inequality is to divide all households in the country in ascending or descending order into five parts (called quintiles) or 10 parts (called deciles) and to determine the share of total income received by each group. Inequality is calculated by dividing the percentage of income received by the poorest 20% of households by the percentage of income received by the richest 20% of households. The higher this ratio, the more even the distribution of income. A unit value would indicate complete equality, but it must be emphasized that inequality is based only on extreme values and ignores income recipients between 20% and 80%.

In the scientific literature, indicators of income inequality are divided into certain groups. Blažiene and Zabarauskaite (2011) divided the indicators of measuring income inequality into two large groups:

- relative indicators (deciles, quintiles, quartiles and other indicators),
- coefficients (Gini coefficient, Lorenz curve, variation, differentiation and concentration indicators).

Čiulevičienė, Čiulevičius, & Šiuliauskienė (2006) distinguished three main groups of inequality measurement methods:

- Structural coefficients (decile, quartile and quintile),
- Graphical (Lorenz curve),
- Special coefficients (Gini coefficient, Robin Hood index).

Before discussing the main indicators of income inequality, it is worth noting that the calculation of economic inequality indicators does not consider the income of individuals, but of households. They include both household income from work and property and transfer benefits.

Ivaskaite-Tamosiune (2015) states that when assessing income inequality, it is important to distinguish between primary and disposable income, the concept of this income is presented in Table 2.7. Primary income is the income earned by a resident on the market before tax and social benefits. They differ from disposable income that a resident can devote to consumption or savings.

Table 2.7. Income concept and components

Assessing income inequality	Income components
Primary (gross) income inequality	Employment income + income of self-employed persons + pensions from private funds + severance pay + income from investments + income from rent + income from children under 16 + private transfers from other households + alimony = primary (gross) income
Disposable income inequality	employee's social insurance contributions – personal income tax + social insurance benefits (old-age pension, disability pension, widow's pension, early pension, maternity benefit, maternity (paternity) benefit, paternity benefit, unemployment insurance benefit, sickness benefit) + social assistance benefits (housing allowances, social benefits, municipal support, child benefit, lump-sum child benefit, care allowance, education-related benefits, lump-sum benefit for a pregnant woman) = disposable income

Source: Ivaskaite-Tamosiune (2015, p. 22).

The Lorenz curve is a way of showing the distribution of income (or wealth) within an economy. It was developed by Max O. Lorenz in 1905 for representing wealth distribution. The Lorenz curve shows the cumulative share of income from different sections of the population. If there was perfect equality – if everyone had the same salary – the poorest 20% of the population would gain 20% of the total income. The poorest 60% of the population would get 60% of the income (Rakauskienė et al., 2017).

The Lorenz curve, which depicts the relationship between the household comparative share and income, is often used to reveal the essence of the problem of income inequality and to perform statistical graphical analysis. This curve shows the share of income received by households, ranked from the lowest income to the richest households. The share of income received by the total population is arranged in ascending order, marking the share of the population (households) as a percentage on the X axis and the percentage share of their income on the Y axis. The straighter the curve, the lower the income diversification. The greater the curve, the greater the income diversification (Figure 2.52).

According to Figure 2.52, on the horizontal axis of the Cartesian coordinate system, the percentage of households are presented, and on the vertical axis, the percentage of income. Households are usually divided into five parts, each comprising 20% of the households. Household groups are presented on the axis from poorest to richest. Total (or absolute) inequality is represented by a semi-angular OE, total (absolute) inequality is represented by OGE. In reality, the poorest part of the population receives about 5-6% of gross income, and the richest – 40-45%. As a result, the Lorenz curve is between the curves of absolute equality

and absolute inequality. The more uneven the distribution of income, the more convex the Lorenz curve, the closer to the point G, and the lower the level of differentiation, the closer it is to the semi-angular OE.

Figure 2.52. Lorenz curve



Source: Rakauskienė et al. (2017).

The inequality is also described by the Gini coefficient. This is an income distribution indicator used to analyze the Lorenz curve. It is calculated as the ratio of the area (dashed) of the figure OABCDE (Figure 2.52) to the area of the triangular OEG. It can be expressed as a percentage. The closer this ratio is to 100 %, the greater the degree of inequality. Accordingly, the closer it is to zero, the lower the degree of inequality.

The Gini coefficient shows the ratio of the income difference of two recipients to the average income according to their ranking position in terms of income (Deaton, 2013), thus it can also be calculated according to the formula:

$$G = \frac{10\,000 - \sum f_i (\Phi_i + \Phi_{i-1})}{10\,000},$$

where:

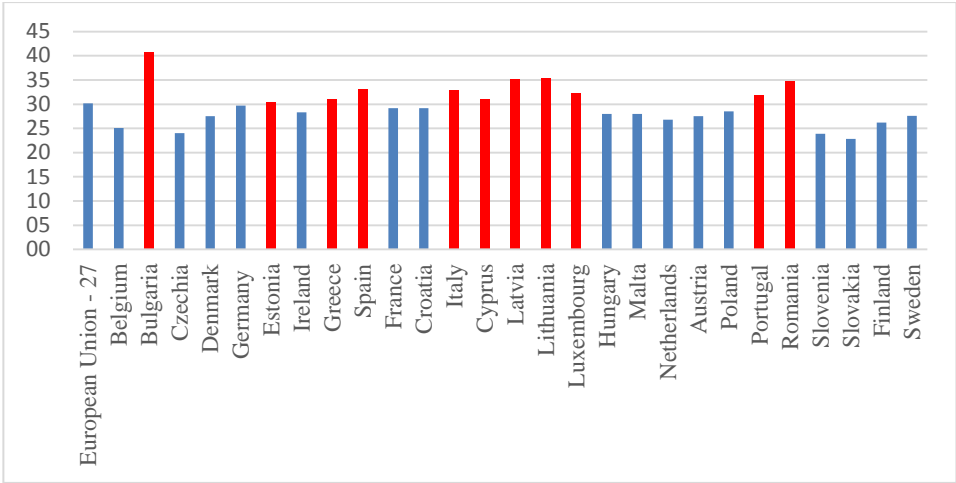
f_i – the relative weights of specific income groups of household members;

Φ_i – the sum of income weights up to the i -th group;

Φ_{i-1} – the sum of income weights up to group $i - 1$.

Figure 2.53 shows the values of the Gini coefficient for EU countries in 2019.

Figure 2.53. Gini coefficient values in EU countries in 2019



Source: Based on Eurostat data: <https://ec.europa.eu/eurostat/databrowser/view/tessi190/default/table?lang=e>

Analyzing the values of the Gini coefficient in the European Union countries (Figure 2.53), it can be estimated that in Estonia, Greece, Bulgaria, Portugal, Spain, Italy, Cyprus, Latvia, Lithuania, Luxembourg and Romania, income inequality is higher than the overall EU average, while in France, In Ireland, Croatia, Germany, Cyprus, Malta, Luxembourg, Denmark, Belgium, Austria, Poland, Slovakia, Slovenia, the Netherlands, the Czech Republic, Hungary, Sweden and Finland, it is lower. The EU average Gini coefficient is 30%.

The 45° line representing total equality in Figure 2.52 (with the Lorenz curve coinciding with total equality) can also be related to one of the simplest inequality indices used in econometrics, the so-called Robin Hood index, estimating the vertical distance from the Lorenz curve to the 45° line and thus measuring what proportion of society's income has to be taken from the rich and passed on to the poor in order to achieve total equality, which is what inspired such an index name in the name of the world equalizer (Angelsen & Wunder, 2006). Clearly, higher values of this index indicate a more unequal society, so a larger share of income needs to be redistributed to achieve equality.

In very poor countries, Gini coefficient values are small because most people are poor. Moderately rich countries already have a larger share of the population in each income class, but the average income level limits the opportunities to pass

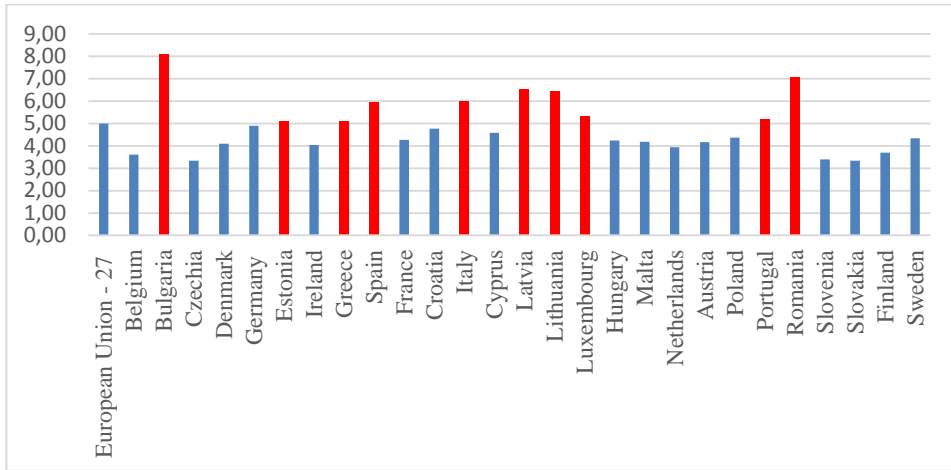
on income to the poor. And in rich countries, it is already relatively easy for many who live in affluence to pass on part of their income to the few who are poor. In relatively equal countries such as Germany, Denmark, Sweden and Norway, the Gini coefficient is about 0.25; in OECD countries, the average for this indicator is 0.315. But even when the Gini coefficient in a country becomes higher than a seemingly safe limit of 0.30, negative social consequences may already begin to manifest themselves.

The decile ratio is calculated as the ratio of the tenth to the first decile. An increase in the ratio indicates an increase in the income of the richest strata compared to the income of the poorest strata. The first decile shows the 10% share of the national equivalent income of the poorest in the total income of the population. The tenth decile shows the share of the national equivalent income of the richest stratum of 10% in the total income of the population.

Decile and quintile income differentiation coefficients are often used to estimate income inequality. Deciles are calculated in ten equal parts (quintiles into five) divided by a row consisting of subjects, arranged in ascending order according to the level of equivalent disposable income per conditional person. The first decile (quintile) consists of households with the lowest equivalent disposable income and the tenth (fifth) with the highest. The decile factor is calculated as the ratio of the tenth to the first decile. The quintile income differentiation coefficient (S_{80}/S_{20}) is calculated as the ratio of the average income of the richest 20% of the population to the average income of the poorest 20%, respectively. For example, if the S_{80}/S_{20} ratio is 5.0, it means that the annual income of the 20% richest households is five times higher than the annual income of the poorest 20%. A higher value of the S_{80}/S_{20} ratio means higher income inequality; a lower value of this ratio means less inequality. If the S_{80}/S_{20} ratio were 1.0, it would mean that the equality of income is ideal, i.e., the annual income of all households is the same.

Analyzing the income ratio between quintile groups in the EU countries in 2019, as might be expected, the countries in terms of the size of this difference are located similarly to the Gini coefficient (Figure 2.54). According to this indicator, which measures the degree of income inequality, Bulgaria also ranks first. This income ratio shows that the income of the Bulgarian population differs by as much as 8.1 times between the lowest income of 20% and the highest income of 20%, compared to the overall EU average of only 4.99.

Figure 2.54. Income quintile share ratio S80/S20 for disposable income in EU countries in 2019



Source: Based on Eurostat data: http://appsso.eurostat.ec.europa.eu/nui/show.do?lang=en&dataset=ilc_di11

Another indicator for measuring income inequality is the Hoover coefficient (Portnov & Felsenstein, 2010; Roy & Haldar, 2010). The values of the Hoover coefficient as well as the GINI coefficient can vary from 0 to 1, which means that the higher the value of the coefficient, the higher the income inequality. This coefficient is not often used to estimate the magnitude of income inequality. Nevertheless, according to Portnov and Felsenstein (2010), the Hoover coefficient is the most appropriate for determining regional income inequality.

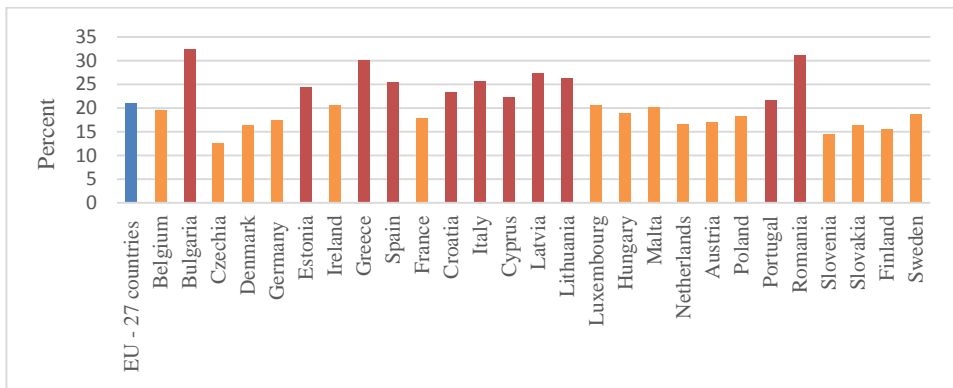
Other coefficients and indices (such as the Atkinson index, Theil index, etc.) are also used to measure income inequality, but these indicators are quite difficult to interpret and are therefore used quite rarely in the analysis of income inequality.

In summary, the Gini coefficient is considered to be the best indicator of inequality and is widely used in various economic studies. Also a popular and frequently used measure of income inequality is the Lorenz curve. Structural coefficients are used to measure income distribution: mode, median, decile, quintile, and quartile differentiation coefficients. However, it is difficult to cover the diversity of income inequality with a single factor, so it is necessary to go beyond a single method to better understand the situation.

Problems of inequality and measures to reduce them

Increased inequality in many member states raises concerns about the sustainability of growth and social cohesion. The problem of income inequality is closely linked to poverty, which is measured by the percentage of people living in households whose income is below a certain threshold, linked to the median household income. The fact that poverty is declining also means that income inequality is declining. Percentage of people at risk of poverty or social exclusion is shown in Figure 2.55.

Figure 2.55. People at risk of poverty or social exclusion by age and sex in 2019



Source: Based on Eurostat data: http://appsso.eurostat.ec.europa.eu/nui/show.do?lang=en&dataset=ilc_peps01

From Figure 2.55, we see that the proportion of people at risk of poverty or social exclusion varies across the EU. The EU average reaches 20.9%. According to this indicator, the highest proportions of people at risk of poverty or social exclusion are in Bulgaria, Estonia, Greece, Spain, Croatia, Italy, Latvia, Portugal, and Romania, and the lowest in Belgium, the Czech Republic, Denmark, Germany, France, Austria, etc.

Population inequality has economic, social and psychological consequences that (European Commission, 2017):

- reduce the progress of the state and its development opportunities,
- increase the fragmentation of society,
- slow down the development of civil society,
- degrade people's quality of life,

- increase psychological stress in society,
- cause psychological problems for individuals, families, and individual groups.

The success of preventing and reducing inequalities depends largely on the actions and reforms of the member states. The EU's role is to support and complement member states' social inclusion and social protection policies by providing policy guidance and financial support for reforms. Member states can use a variety of policy levers to ensure greater income equality and equal opportunities. However, the adequacy of response policies depends on:

- an in-depth analysis of the factors contributing to inequality in each Member State,
- country-specific factors such as the unemployment rate, the sectors that make up the country's economy, labor market institutions and the structure of the social security system.

One of the key policy instruments to reduce inequalities and promote equal opportunities is investment in education and skills. In particular, in response to changes in working methods due to technological developments, the most effective way to close the pay gap is to raise the skills of low-skilled employees and create more jobs. Education is effective in creating more equal opportunities for children and young people, as long as all children, regardless of their social background, have access to high-quality education. The main lever for reducing inequality is the tax and benefit system. While policies to address skills shortages are beneficial in the medium and long term, a faster impact could be expected from the adjustment of the tax and benefit system. Some countries, such as Ireland, Hungary, and Denmark, are effectively applying tax and benefit systems to reduce very high market income inequalities. In other countries, such as Cyprus, Bulgaria, Latvia, Lithuania, and Estonia, these effects are much weaker. The inequality-reducing effects of the social spending system depend on the adequacy of its structure. Important policy measures to ensure that the unemployed and inactive are always given an economic incentive to take up paid work are less frequent cessation of benefits for those who have returned to the labor market and a reduction in the tax burden on low-income earners. Since the beginning of the crisis, the capacity of the tax and benefit system to ensure that market inequalities do not increase has been declining. In some countries, limited fiscal room for manoeuvre and the need to restore the sustainability of public finances have reduced the ability of the state to redistribute revenues. The personal income tax system has not become more progressive, with several EU member

states, such as Latvia, Lithuania, Estonia, Bulgaria, and Romania, applying a flat-rate tax system. Property inequalities could be curbed by a well-structured tax system. Taxation of capital (including assets and inheritance) with due regard for efficiency aspects may be an appropriate measure to ensure a level playing field and a more equitable distribution of assets. One of the most important measures to combat growing inequalities of opportunity is the provision of quality social services. The most important levers to prevent social disadvantage from being passed down from generation to generation are:

- high quality childcare available;
- social housing,
- education,
- health care.

Access to child and long-term care is also crucial to enabling women to participate more actively in the labor market, which can help reduce gender inequalities. If the territorial dimension contributes to inequalities, including the very large gap between rural and urban areas, such as in Romania and Bulgaria, investment in transport and greater digital access can also play an important role.

Inequality in the context of SDG's 2030

In September 2015, 193 world leaders adopted the Sustainable Development Goals (SDGs) and called for a “data revolution” to enhance accountability in measuring the progress towards their fulfillment. The SDGs have 17 goals of which the first is to “end poverty in all its forms everywhere”. These 17 Global Goals officially known as the Sustainable Development Goals or SDGs. The goals of sustainable development cover the social, economic and environmental spheres of life, from gender equality to responsible consumption and production to the preservation of life on Earth, all of which are clearly important to each country. Although divided into 17 broad themes, the objectives are closely inter-linked, such as reducing inequalities of various forms within a country and between countries (SDG 10), education (SDG 4) and participation in decision-making (SDG 16) (United Nations [UN] (n.d.).

Monitoring progress towards the fulfillment of the Sustainable Development Goals (SDGs) requires the assessment of potential future trends in poverty (Cuaresma, Fengler, Kharas, Bekhtiar, Brottrager, & Hofer, 2018). In the 2030 Agenda for Sustainable Development, Goal 10 aims to reduce inequalities within

and between states. SDG 10 (Reducing Inequalities) aims to tackle various forms of inequality, from income inequality and gender inequality, from barriers to participation in politics to inequalities due to climate change, etc., within and between countries. This objective is characterized by certain indicators to determine the level of its implementation. Objectives and indicators defining the goal are presented in Table 2.8.

Table 2.8. Targets and indicators of Goal 10

No.	Target	Indicator
1	2	3
10.1	By 2030, progressively achieve and sustain income growth of the bottom 40% of the population at a rate higher than the national average	Growth rates of household expenditure or income per capita among the bottom 40% of the population and the total population
10.2	By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status	Proportion of people living below 50% of median income, by age, sex and persons with disabilities
10.3	Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard	Proportion of the population reporting having personally felt discriminated against or harassed within the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law
10.4	Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality	Labor share of GDP, comprising wages and social protection transfers
10.5	Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations	Financial Soundness Indicators
10.6	Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions	Proportion of members and voting rights of developing countries in international organizations
10.7	Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies	Recruitment cost borne by employee as a proportion of yearly income earned in country of destination. Number of countries that have implemented well-managed migration policies
10.a	Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements	Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff

Table 2.8 cont.

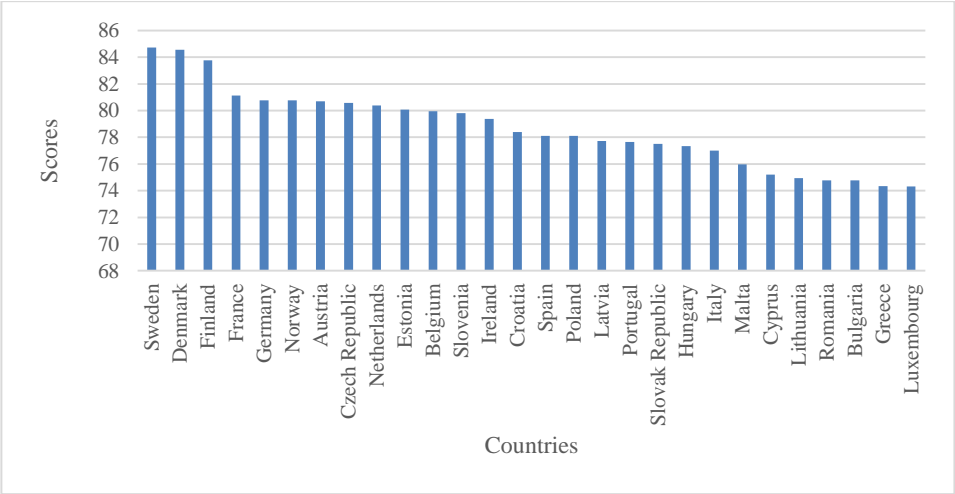
1	2	3
10.b	Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programs	Total resource flows for development, by recipient and donor countries and type of flow (e.g., official development assistance, foreign direct investment and other flows)
10.c	By 2030, reduce to less than 3% the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5%	Remittance costs as a proportion of the amount remitted

Source: Based on: United Union [UN] (n.d.).

According to the indicators listed in Table 2.8, the countries monitor these indicators and thus decide on the level of implementation of Goal 10.

The sustainable development index is calculated to determine the level of implementation of all seventeen sustainable development goals. Countries are ranked by their overall score. The overall score measures a country’s total progress towards achieving all 17 SDGs. The score can be interpreted as the percentage of SDG achievement. A score of 100 indicates that all SDGs have been achieved. Sustainable development index of EU countries is presented in Figure 2.56.

Figure 2.56. Sustainable development index of EU countries



Source: <https://dashboards.sdgindex.org/rankings>

Figure 2.56 shows that Sweden, Denmark, and France have reached the best level for achieving the sustainable development goals, while Romania, Bulgaria, Greece, and Luxembourg have reached the lowest level. Reducing inequality requires transformative change. Greater efforts are needed to eradicate extreme poverty and hunger, and invest more in health, education, social protection and decent jobs especially for young people, migrants and other vulnerable communities.

KEY TERMS

Income inequality, types of inequality, inequality measurement, Gini coefficient, Lorenz curve, problems of inequality.

SUBCHAPTER SUMMARY

Socio-economic inequality is most often examined in scientific works on economic topics. Social inequality is linked to restrictions on property, voting rights, freedom of expression and assembly, access to health care or education, and employment. In other words, these are differences in the position of social groups in the hierarchy of society, which are usually determined by education, kinship, occupation, etc. Economic inequality is the inequality of the country's population income (population income differentiation) and expenditure distribution, i.e., the difference in their size between different social strata and groups in society. Income inequality is prevalent not only in developing but also in developed countries, and therefore, this social phenomenon is one of the most pressing global problems. Income inequality is defined as differences in income in an economy between persons, individuals, households, countries, or any other identifiable combination of entities. Different measurement methods are used to measure income inequality – Lorenz curve, Tayle index, Robin Hood index, coefficient of variation, decile ratio, but the most popular and most commonly used is Gini coefficient. It has economic, social and psychological consequences that reduce the progress of the state and its development opportunities, as well as the quality of life of the people. Income inequality in many countries has gone beyond economic security and has become a brake on the quality of life of the country's population and the development of the economy as a whole, and a source of social tension. The increase in income inequality in recent years has

been driven by political instability, income redistribution, globalization, financialization, technological progress, international trade, and other causes. The issue of inequality is also important in the 2030 Agenda for Sustainable Development, which aims to reduce inequalities within and between countries. Thus, income inequality is a global problem that requires global solutions. This involves improving the regulation and monitoring of financial markets and institutions, encouraging development assistance and foreign direct investment to regions where the need is greatest. Facilitating the safe migration and mobility of people is also key to bridging the widening divide.

DISCUSSION QUESTIONS

1. Are you surprised by the statistics about inequality presented in the Subchapter? Why or why not?
2. What exactly are the problems caused by inequality?
3. How can governments intervene in order to stem inequality?
4. Why should one focus on income inequality? Are there other measures that are more meaningful?
5. What are the possible negative consequences of the rise in income inequality?

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2.3. Societal sustainability threats

2.3.1. Diseases and limited health care

Ilaria Colivicchi^a

LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- understand the responsibility of climate change for the emergence of diseases,
- understand Goal No. 3 in the agenda 2030 to ensure health and well-being,
- acknowledge the meaning of disease and disability,
- recognize the power of prevention in numbers,
- comprehend the role of insurance as an opportunity for healthcare,
- analyze the main characteristics of healthcare insurance policies.

Disease and climate change: The Goal No. 3

Health, well-being, and sustainability are closely related concepts. According to the Sustainable Development Goal No. 3 of the United Nations which states that to “ensure health and well-being for all and for all ages” it is essential to protect our ecosystem by promoting a healthy life and socio-economic development

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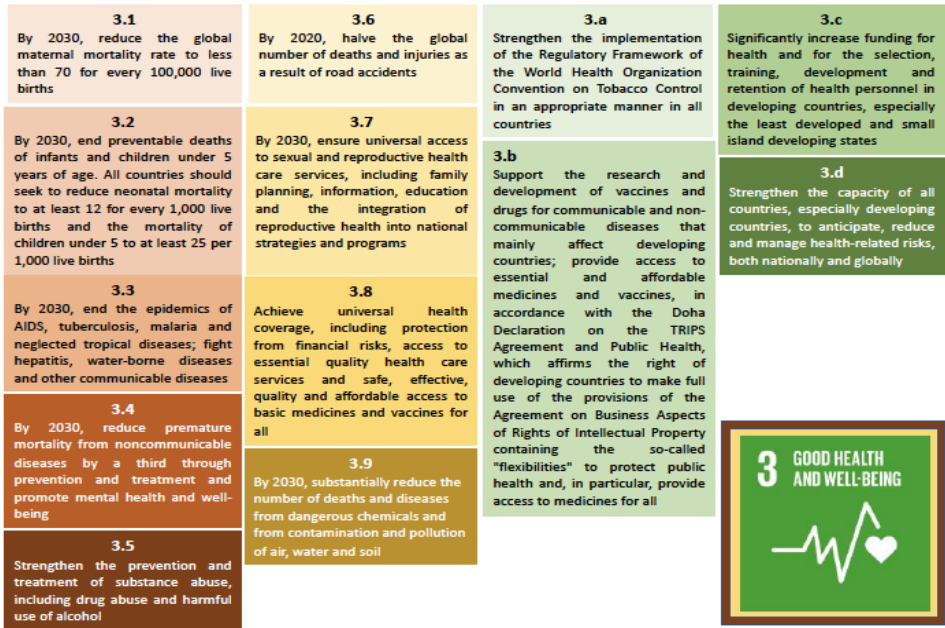
based on the use of environmental resources in a sustainable way (https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2021.pdf).

Climate change is responsible for the emergence of new chronic diseases and the worsening of many existing ones. For example, consider the quality of the air necessary for the life of the ecosystem, the drinking water factor, and the ability to feed properly, which are essential for the proper survival of every organism. In the last twenty years, the impacts of climatic events on diseases and deaths caused by the increase in temperature, by extreme events, by polluted ecosystems are being studied. These problems hurt the health of the population but also have an important economic component (Salas & Jha, 2019; Caren, Solomon, & LaRocque, 2019).

Life expectancy has been increased due to the interventions put in place to protect health and some common causes of death from infant and maternal mortality have been reduced. Despite many interventions to improve the availability of drinking water and the quality of hygiene, works have been undertaken to combat diseases such as malaria, tuberculosis, polio, and HIV, these diseases along with many other diseases remain to be eradicated.

According to the 2030 agenda, the main goals set regarding objective 3 are summarized in the following Figure 2.57.

Figure 2.57. Goal No. 3 Good health and wellbeing



Source: Author’s own elaboration.

By 2030 there are many goals that states have set for sustainable development in the field of health, especially in developing countries and small islands. Some interventions are aimed at reducing mortality through interventions for the protection of mothers and children (3.1 and 3.2), family planning, information, education, and the integration of reproductive health into national strategies and programs (3.7) and the treatment of infectious diseases and chronic diseases (AIDS, tuberculosis, malaria, tropical diseases, hepatitis, water-borne diseases); other interventions aim instead at spreading a culture of prevention and well-being (3.4 and 3.d).

These programs must be associated with those aimed at improving the entire ecosystem (air, water, and soil quality) that directly impact human health (3.9). A very important program is supporting the research and development of vaccines and providing access to medicines and vaccines and health care services for all.

According to these programs, what is meant by disease? A disease is a condition of a living organism other than normal that results from an alteration of an organ or tissue or its functionality. The disease in humans is referred to as a generic situation that causes physical, mental, and social problems up to death. In the broadest sense, therefore, the term disease also takes into consideration injuries, disabilities, unstable behaviors of the subject depending on the reference context in which it is used. The disease is often contrasted with health whose definition is found in the Constitution of the World Health Organization (WHO) which is a specialized institution of the ONU (United Nations Organization). By health, we mean a condition of efficiency of one's organism that does not present physical or psychological alterations concerning one's age. The World Health Statistics 2020 report highlights that life expectancy and healthy life expectancy (HALE) increased by more than 8% globally between 2000 and 2016. One of the factors that most influences its performance is certainly income so much that low and middle-income countries are those in which the most serious problems related to human health remain.

Although the improvement in both indicators can largely be traced back to actions taken to reduce infant mortality and fight infectious diseases, it is low- and middle-income countries which have indicators well below the global average. The main indicators used for monitoring the SDGs regarding universal health coverage (UHC) are the service coverage ratio (essential health services) and the incidence of out-of-pocket health expenditure on the population (Kennedy, Wood, & Frieden, 2017).

The coverage ratio of the service increased from 45 to 66 globally from 2017 to 2000 respectively, with a higher incidence in low-middle income countries and in particular regarding the objectives indicated in the previous figure regarding the protection of mothers and children and the treatment of infections.

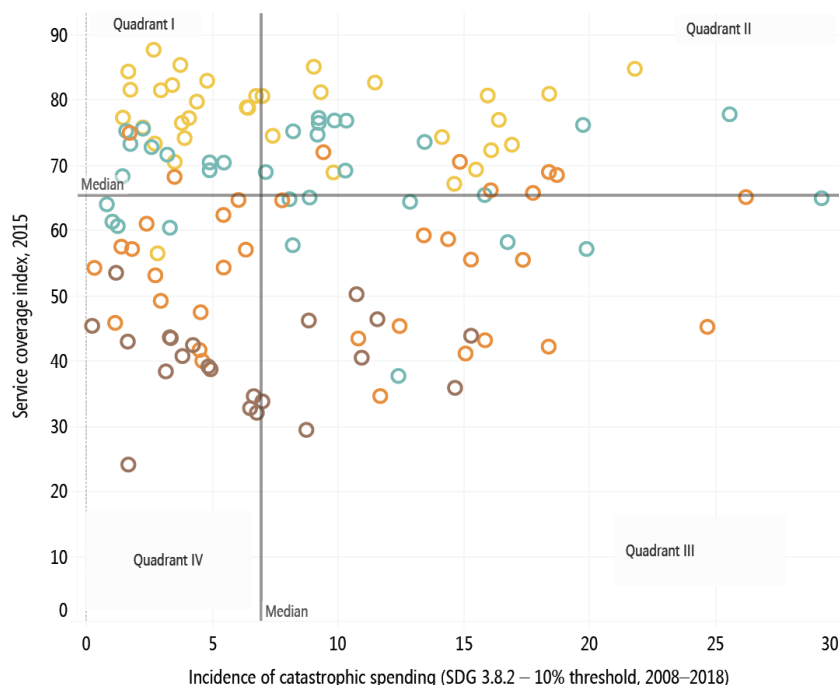
Health systems where people have the opportunity to rely on considerable financial protection, health care is not a difficulty even if climate change has made it necessary to face new catastrophic challenges and unfortunately medical care has increased since 2000.

Out-of-pocket health spending dictates a choice between spending on health and spending on other needs. Surveys conducted by the World Health Organization show that in 2015 about 927 million people (12.7% of the world population) spend more than 10% of their economic possibilities on health. This increase was generally recorded in all regions except for the Americas, but again, the majority of people (87%) with out-of-pocket healthcare payments reside in middle-income countries and the trend continues to grow for the next few years (World Health Statistics, 2015).

These out-of-pocket health care costs are a dangerous cause of increasing the number of people entering poverty.

The Figure 2.58 shows the incidence of out-of-pocket expenses for the service coverage index; the plan is divided into four quadrants. In the quadrant I there are countries with high coverage of the service and also low financial difficulties that you should focus on maintaining high profits to continue enjoying the health care service without problems. In quadrant II there are countries with good coverage of the health service but with high financial difficulties in incurring out-of-pocket health care expenses; these countries engage in health financing reforms to enjoy the services available. Countries with poor health service and a high financial problem (quadrant III) fully reform health services and also financing strategies, while quadrant IV countries focus only on health system reform.

Figure 2.58. Leverage of services coverages and financial protection, by country income group



Source: World Health Organization [WHO] (2019).

Achieving Goal No. 3 would be to eliminate the inequalities between the different countries of the health service and make it accessible to all, guaranteeing a basic health service without distinction of income and geographical location.

Disease and disability

Disability is part of human being. From 1970 to today different responses to the concept of disability have been devised both by private associations and by the tendency to provide greater importance related to people with disabilities. In the course of history very often people with disabilities have found themselves excluded, marginalized, however, in more recent years we have tried to move the concept of disability no longer as a personal state, but as an environmental problem through inclusion in education and search for new medical solutions.

If we wanted to define disability we should necessarily refer to a dynamic complex concept that takes into consideration many different dimensional aspects. In recent years, important roles have been identified regarding social and physical barriers. The concept of disability has therefore moved from an exclusively individual definition to a definition connected to the identification of medical and social perspectives and also moved from a personal model to a social model.

According to this new approach, disability is no longer an attribute only of the person, but is conditioned by environmental factors such as good nutrition, poverty, working conditions, climatic agents that impact the distribution of disasters and water, as well as fundamental access to medical care (Ossebaard et al., 2021). If we assume that the environmental context impacts disability we should act through appropriate political laws to change the application of technological innovations to structures and health care. The International Classification of Functioning, Disability, and Health, known as ICF, is the WHO framework for measuring health and disability for a person and for the population in general defined in the Fifty-fourth World Health Assembly on 22 May 2001 by all 191 WHO Member States.

WHO provides a set of integrated classifications called Family of international classifications (FICs), which collect health information from around the world and how it should be collected and presented. There are Reference classifications, Derived classifications, and Related classifications.

The former group international reporting and cover the main parameters of health. WHO deals with three primary reference classifications:

- International Statistical Classification of Diseases and Related Health Problems (ICD),
- International Classification of Functioning, Disability, and Health (ICF),
- International Classification of Health Interventions (ICHI).

The Derived classifications are extensions of the reference classifications to set themselves better in a specific context, for example at a national level. The Related classifications instead are complementary to the reference and derived classifications and cover specific issues not contained in the FICs.

The aging of the population leads to a sudden increase in disability and, consequently, a higher necessity for health plans.

Studies conducted in literature and international organizations show that there is still considerable difficulty accessing health care, not only due to one's availabil-

ity of income but also due to race, ethnicity, and socioeconomic status, age, sex, disability status, sexual orientation, sexual identity, and residential location (Kennedy et al., 2017; Tønnessen-Krokan et al., 2021).

Penchansky and Thomas published in 1981 an article titled “The Concept of Access: Definition and Relationship to Consumer Satisfaction.” They define access as one of the most important conditions to refer to stress on to obtain a good healthcare level (“ ‘access’ is a major concern in health care policy and is one of the most frequently used words in discussions of the health care system”).

According to the two authors, five key characteristics describe access to care: affordability, availability, accessibility, housing, and acceptability. Accessibility is commensurate with the subject’s ability to financially support the costs of the health service. Availability depends on the possibility of being followed by competent health personnel and technologies suitable for health treatment. Accessibility refers to geographic accessibility, that is, the simplicity with which a person can physically reach the place of care. Finally, we have the accommodation which is linked to the organization of health care with the preferences of the patient himself.

To have a good degree of accessibility, all the characteristics indicated above must be related to age, gender, ethnicity, etc., so that the disability or, in general, the disability can be reduced or assisted, to reach goals 3.7 and 3.8 indicated in the previous paragraph.

Access to health care affects general physical, social and mental health and quality of life. The main barriers that can be encountered consist in too-high cost of health services, lack of adequate treatment facilities or adequately trained personnel, lack of the state welfare system that transfers the entire disease risk to the subject, and lack of health insurance coverage if the available options are inadequate or too expensive (Sumankuuro, Crockett, & Wang, 2018).

These barriers to access health services cause significant problems to the social structure of the country in which they are present: unmet health needs, delays in receiving appropriate care, inability to get preventive services, financial burdens (Tønnessen-Krokan & Bringedal Houge, 2021).

Inadequately treated health needs worsen; delays in the delivery of services or a total inability to treat the disease create real social inequalities. The delay is often associated with a worsening of the health situation and in turn, implies the need to bear higher costs when a good preventive activity could have avoided subsequent complications. Lack of adequate coverage means that people cannot

enjoy health care. In countries where health care is linked to the mere presence of insurance, there is a higher probability of poor health for people with low income. The lower chance of receiving medical treatment leads to a late diagnosis and a higher probability of premature death.

Improving access to health care services, therefore, depends on having a health facility where care is regularly received. People who can receive timely and adequate care have a better state of health, bear overall lower costs and, above all, fit into a social context with fewer disparities. The improvement of health care is also based on the possibility of carrying out prevention services among the population, promoting healthy living behaviors that reduce risk factors, providing protection to people at risk through, for example, appropriate vaccinations, and identifying potential risk factors before the clinical development of the disease (Healthy People, 2020).

From patient empowerment to the power of prevention

The health situation in the various countries of the world is very different. If we focus on health systems in Europe, we see that they too are by no means exempt from having to deal with major changes in population and related needs. These new needs require a quick adaptation to keep up with the times. The climate changes that cause major changes to the ecosystem certainly do not spare the population (Salas & Jha, 2019). The population is aging strongly (it is estimated that by 2050, 37% of the European population will be over 60 years old). Chronic diseases, which are currently responsible for more than 86% of deaths, that affect more than 60% of people over 65 years old, are on the rise and this will entail having to support more health care (estimated at around 75% of annual health expenditure). Nearly 9% of GDP and 14% of total spending on average in the EU Member States is on health and nearly two-thirds is spent on hospital and outpatient care. High-impact numbers indicate that the issue of the sustainability of health systems is more than ever unavoidable.

These data cause concern in the states and generate economic pressures. WHO believes that government cuts in public spending on health have undermined the continent's health systems. A possible way forward to respond positively to ongoing health developments could be to empower all the different stakeholders (patients, the health sector in general, the government, and the economic sector).

The European Steering Group on Sustainable Health Care (ESG), which brings together the best academics, policymakers, patients, and industry, was formed in 2014 to develop concrete plans for long-term sustainability.

The European Steering Group (ESG) has produced a European White Paper “Acting together. Roadmap for Sustainable Healthcare”. The book proposes 18 actions to improve the sustainability of European health systems with the aim that the various stakeholders act together.

The document, based on evidence gathered and initiatives carried out in 24 EU countries, formulates 18 recommendations to improve the sustainability of European health systems addressed to the various interlocutors of national and European institutions and highlights the need for all stakeholders in the health sector to act together.

The Roadmap of the ESG group only indicates the beginning of a direct path towards the sustainability of healthcare.

The transformation of healthcare is complex and cannot be achieved quickly or through isolated actions and for this reason, the actions indicated require a collaborative effort according to an integrated approach.

The 18 recommendations drawn up by the ESG group are the result of work carried out through 30 pilot projects in 24 European countries and concern three main themes: the prevention and early treatment of any pathologies, greater empowerment, and empowerment of the population, and the reorganization of the provision of health services.

It will be necessary to implement a focus on prevention for health investments to:

- define a European target for investment, treatment, prevention, and early intervention,
- develop a scoreboard capable of monitoring progress for all EU member states,
- introduce alignment of monitoring regarding health trends and data collection.

New rules and regulations at the European level for data protection will be needed to ensure their appropriate use to develop intervention strategies in the health field and at the same time guarantee the privacy of patients.

The involvement of employers, health professionals, and the occupational medicine sector is of fundamental importance for the smooth functioning of this integrated development.

The population itself must be part of the integrated development of the health system and real health illiteracy must be pursued (Abbvie & Università Cattolica del Sacro Cuore di Milano, 2015).

The adoption of new technologies to support the transformation of healthcare will be the basis for a successful development project (Erickson & Jennings, 2017).

Insurance as an opportunity for healthcare

A health policy is a form of complementary insurance designed to “compensate” for the assistance provided by the National Health System.

Some services are not covered by the Health System or others must be paid in full. To this are added the waiting times, the medicines which, in most cases, have a cost that must be borne by the person concerned, lack of agreements for some types of services. Medical care is, therefore, in particular social and territorial situations, difficult and too onerous. In this context, health policies have an active role which, against the payment of a premium, guarantee coverage of the costs of services, medicines, treatments, etc. If the state system does not guarantee public health protection, an example across the United States, these policies are very widespread as they are the only way to be treated (signing a policy guarantees payment for the various services) (Kennedy et al., 2017).

The health policy can be:

- Daily allowance to supplement the income that is lacking due to inability to work. This policy guarantees a sum of money for each day of convalescence or hospitalization.
- Full coverage and provision, within the limit established by the ceiling, reimbursement for all costs incurred.
- Coverage of surgical interventions, which guarantees reimbursement in case of interventions and hospitalizations. Health policies cover various health-related expenses where everything depends on the type of policy you subscribe to, the insurance company, the premium you pay.

There is numerous and different insurance coverage on the insurance market with the most diverse contractual structures that provide for the inclusion or exclusion of particular health costs. More recently introduced on the market are

the Dread Disease policies which are designed to cover the risk of the onset of particularly serious diseases and which commit the insurer to the disbursement of capital, without the restriction of use, to the insured who is struck by serious diseases contractually defined. Long Term Care policies are always of the new generation. These are insurance contracts designed to cover the risk of loss of self-sufficiency, that is, the inability to perform the elementary acts of daily life.

Technically ADL (activities of daily living) and those that are generally considered for insurance purposes are:

- move, get up and go to bed or sit on a chair,
- washing and maintaining an acceptable level of personal hygiene,
- dressing and undressing,
- drink and eat independently,
- to be continents,
- speech or hearing ability.

Accident insurance is dedicated to covering different types of risks. The situation that you want to cover with this type of policy is linked to the impossibility of contributing to the family trend, both in the case of temporary disability (which prevents you from working for a certain time) and in the event of permanent disability (a definitive time).

A different risk profile is covered with the PHI. Permanent Health Insurance, abbreviated to PHI, is a form of insurance created to cover the risk that the insured, due to an accident or illness, is unable to receive income from work.

Upon the occurrence of the risk, the insurance company undertakes to pay an annuity at a predetermined rate for the periods of forced inactivity of the insured.

The structure of this policy is very different from traditional accident policies, its main characteristics in addition to those already seen are:

- the duration is several years, but cannot exceed the retirement age,
- the definition of “permanent” cannot be cancelled from here,
- the annual premium is constant over time,
- they have an absolute time limit,
- a short period for the qualification of the disease,
- an initial waiting period.

The contemporary response of the health insurance market is constituted by health policies linked to the use of digital technologies (so-called digital health insurance).

Both nationally and internationally, the latest generation of policies which, through the use of digital devices (such as electronic bracelets and other wearables), use genetic diagnostic tools. These tools obtain precise information on the state of health of the insured to calibrate insurance coverage with health services. These devices also push towards healthier lifestyles and “healthy” cooperative behavior. The offer of these policies responds to market needs characterized by new health needs of the population and rapid technological changes (Carrin, Mathauer, Xu, & Evans, 2008). Contemporary society in more developed countries is pushing towards mixed forms of health coverage (public and private) and insurance companies can cooperate to make the welfare system more efficient. The growing technological development of devices, which can automatically synchronize any symptoms of the policyholder with a smartphone or tablet, could be a useful tool for improving some of the five A’s mentioned above.

Conclusions

It is now quite clear that climatic events have a profound impact on the ecosystem and consequently on man and his health. The quality of the air and water are greatly affected by the pollution produced and favor the appearance of new chronic diseases and the progression of those already in existence.

States must therefore necessarily strive to promote well-being and, from an economic point of view, reduce health costs associated with new diseases according to the objectives set and summarized in the 2030 agenda under Goal No. 3. The insurance sector is certainly an important player supporting the growth of well-being with insurance policies suitable for different profiles of policyholders with different coverage needs.

Therefore, if in the most developed countries, the evolutionary strategies traced by scholars and political bodies towards the achievement of the goals for sustainable health travel on the same track with an evolution of the insurance sector, in developing countries the path to be taken, albeit started, remains very long.

KEY TERMS

Disability, disease, digital health insurance, dread disease, healthcare, health care barrier, long term care, Permanent Health Insurance, sustainability Goal No. 3, well-being.

CHAPTER SUMMARY

New chronic diseases and the worsening of many of the existing ones are strongly linked to climate change. The increase in pollution that affects climate change favours the emergence of diseases that undermine the health of entire populations and therefore cause a negative impact on the economic component at the family and state level.

According to the 2030 Agenda, the actions set for the achievement of objective 3 are aimed at improving the health situation to promote well-being. Some interventions are aimed at reducing mortality through the help of mothers and children, education in planning of births and the treatment of infectious and chronic diseases.

Other interventions then aim to spread a culture of prevention and well-being that must be associated with those aimed at improving the entire ecosystem.

It should be noted that the aging of the population inevitably leads to a sudden increase in disability and, consequently, to a greater need for health interventions.

The population itself must therefore be part of an integrated development of the health system but also of a real health illiteracy of citizens.

In countries where the economy is more developed, the adoption of new technologies to support health change will be the basis for positive development.

In this context, the insurance sector plays a primary role. If the state does not guarantee the protection of public health, health policies are one possible solution. Dread Disease, Long Term Care, PHI are examples of coverage on the insurance market (Durham et al., 1998).

Latest generation health policies linked to the use of digital technologies (so-called digital health insurance) constitute the last frontier.

DISCUSSION QUESTIONS

1. What are the main actions within the Goal No. 3?
2. What is a disease? What is the difference between disease and disability?
3. What do the European Steering Group (ESG) want to obtain within the European White Paper?
4. Why can the insurance sector be an important player in the growth of healthcare?
5. Elaborate on factors that can affect a digital health insurance.

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2.3.2. Poverty and hunger

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LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- define poverty and hunger, the reasons why the world hunger is still a problem,
- understand child hunger and poverty and their impact on children,
- identify the breaking cycle of malnutrition and poverty,
- explain the accelerated progress in ending poverty and hunger by 2030,
- analyze the underlying drivers of poverty and vulnerability at the global, national, community and household levels.

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Introduction



The poor themselves can create a poverty-free world – all we have to do is to free them from the chains that we have put around them.

Muhammad Yunus

The statement of Muhammad Yunus* helps us to understand the profound meaning of this subject, namely the extreme poverty of the economically most backward countries and/or remote geographical areas, situations of social exclusion and those that come through the use of specific economic aims to be offered, it is possible to succeed in alleviating these situations of economic and social hardship.

What is poverty? How can it be measured? And to what extent does it affect the world population?

The poorest often live in remote rural areas, they are ethnic minorities and have less education, fewer assets, and less access to markets.

Many cross-country poverty studies measure poverty using the criterion of those living on less than US\$1 a day – the threshold defined by the international community as constituting extreme poverty. Those living below the line are placed into three groups to more easily examine and compare their characteristics:

- Subjacent poor: those living on more than US\$0.75 but less than US\$1 a day.
- Moderately poor: those living on more than US\$0.50 but less than US\$0.75 a day.
- Ultra poor: those living on less than US\$0.50 a day.

* Muhammad Yunus (born 28 June 1940) is a Bangladeshi social entrepreneur, banker, economist, and civil society leader. He was awarded the Nobel Peace Prize in 2006 for founding the Grameen Bank and pioneering the concepts of microcredit and microfinance.

The average energy requirement for adults who take light activity is 2,200 calories per day, and those who consume less than 2,200 calories were divided into three groups:

- Subjacent hungry: those consuming more than 1,800 but less than 2,200 kilocalories (kcal) per day.
- Moderately hungry: those consuming more than 1,600 but less than 1,800 kcal per day.
- Ultra hungry: those consuming less than 1,600 kcal a day.

The highest incidences of ultra-poverty and famine are found in Sub-Saharan Africa, South Asia, Nicaragua, and Timor-Leste. By and large, those living on less than US\$1 a day also consume less than 2,200 calories and there is a high correlation between living in ultra-poverty and living in ultra starvation.

From these studies, it is easy to understand how important and fundamental it is to develop tools aimed at reducing poverty, especially in countries where people live below these thresholds. Effective interventions to reach those living on less than 50 cents per day should be targeted to remote households, traditionally excluded from resources and markets. Social insurance interventions for poor from health shocks, addressing exclusion of groups, preventing child malnutrition and enabling investments – particularly in education – for those with limited resources are essential to help the poorest move out of poverty. Also micro-finance institutions, are increasingly considered as one of the most effective tools to be used in an attempt to solve this social issue.

This Subchapter is organized as follows: Section 1 describes the definitions and indicators of poverty and hunger. Section 2 examines the problems and challenges related to poverty and hunger. Section 3 attempts to see the impact of poverty and hunger on children. Section 4 explains how the vicious circle of malnutrition and poverty can be broken and Section 5, among the Sustainable Development Goals, differentiates country by country approach to achieving zero poverty and hunger by 2030. Section 6 presents a case study of the poorest countries in the world. Finally, the Subchapter offers appropriate conclusions for overcoming the global problem of poverty and hunger.

Poverty and hunger, definition and indicators

Poverty is considered as one of the main reasons for hunger globally. This applies to both rich and poor countries, no matter whether people live in urban or rural areas. Around 8% of the world's population lives in extreme poverty, defined as an income of \$1.90 per day or less (concernusa.org, 2020).

All the definitions assert that poverty is a state in which one cannot afford to achieve a basic standard of living such as food and clothing. Poverty can be considered as a condition of being extremely poor.

According to the World Bank, poverty is classified into two categories. These are income poverty and human poverty. Income poverty is related only to “financial income”, whereas human poverty includes a lack of “proper diet, clothing, shelter, and work” (UKEssays, 2018).

In many sources, hunger is seen as a feeling we have when we need (something) to eat. Hunger is a distress associated with a lack of food. It was reported that the threshold for undernourishment is calorie consumption less than 1,800 calories per day (State of Food Insecurity and Nutrition in the World, 2020; wfp.org, 2020).

At the EU level, the Europe 2020 strategy set a target to reduce poverty by at least 20 million by 2020, which was not achieved. This is measured through a combination of relative and more absolute indicators. According to the latest available statistics at the EU level (2018), almost 110 million people (21.9%) were at risk-of-poverty or social exclusion. Compared to the reference data for 2008, this represents a reduction of 8 million people, instead of a reduction of at least 20 million, as set by the Europe 2020 poverty target (ec.europa.eu/social, 2020). The main reasons for poverty are structural: how income and wealth are distributed and re-distributed.

Conflict is the major driver of hunger: The UN estimates that 122 million of 144 million stunted children live in countries affected by conflict (World Food Programme [WFP], 2019). Also, an estimated 14 million children under the age of five worldwide suffer from severe acute malnutrition, also known as severe wasting, yet only 25% of severely malnourished children have access to lifesaving treatment (Action Against Hunger, 2020).

Poverty and hunger are mutually interconnected. In almost all cases if the household lives in poverty its members cannot afford nutritious food which causes undernourishment. If people are undernourished, then it is more difficult for them to earn more money so they can buy and consume healthy food. Although, in order to increase their income the households that live in poverty could sell off their livestock and provide nutrient-rich food in short-term, it is not a long term solution with respect to malnutrition. Both poverty and hunger are spreading all over the world, but the degree varies from country to country. Less developed countries suffer from it severely, whereas developed countries are affected to a much lesser degree.

According to the World Health Organization, the malnutrition can appear in three basic forms: undernutrition (wasting, underweight), micronutrition (deficiency of important vitamins and/or minerals, also known as hidden hunger) and obesity and overweight. (<https://www.who.int>, 2020). Nowadays, even when enough food is produced for everyone, there are still 821 million people suffering from some from some of the above mentioned forms of malnutrition (<https://www.foodaidfoundation.org>, n.d.).

It was observed that there is co-existence among the three forms of malnutrition mentioned above. “This means that a single country may face the challenge of addressing high rates of stunting, micronutrient deficiencies, and obesity; or a family may have an overweight mother and a stunted child.” According to UNICEF it is so-called “the triple burden of malnutrition, a burden that threatens the survival, growth and development of children, economies and societies (UNICEF, 2019a).

Problems and challenges of poverty and hunger

The statistics on world hunger indicate that the food produced worldwide is enough to feed the global population (sdgs.un.org, 2020). However, there are still more than 690 million people undernourished. Furthermore, the data also show that, in the recent years the world hunger has been rising and is affecting about 8.9% of the global population. In the period from 2018 to 2019 the number of undernourished people increased by 10 million, and now there are nearly 60 million more undernourished people than in 2014 (actionagainsthunger.org). Also the stunting rate (children too short for their age as a result of chronic malnutrition) fell from 33% of children under five in 2000 to 21.3% in 2019 (State of Food Insecurity and Nutrition in the World, 2020).

There are a few reasons why world hunger is still a problem (<https://www.borgenmagazine.com>, 2020):

1. The world hunger primarily arises from the poverty of the people because many of them cannot afford themselves to buy food or to find resources to produce it. Furthermore, some of them cannot even find work and earn money for buying food that would satisfy the minimum daily recommended quality for calories consumption.
2. Climate extremes are also causing poverty and hunger. According to the World Bank statistics more than 100 million people could be hungry in the next 10 years as a result of the climate changes.

3. Wars and conflicts are one of the reasons why the world hunger is not decreasing. Very often during conflicts the land and the resources are destroyed, the transportation infrastructure is destroyed as well. Hence, people in conflicted areas have limited access to food and respective resources, and sometimes it can last for days. Additionally, during times of conflict as a result of increased food prices, the nutrient food becomes even more difficult to afford.
4. According to the World Food Programme (2020), the largest crisis for food nowadays was found to be in Yemen, where about 20.2 million people with the help of humanitarian aid escaped facing hunger. (<https://unwfp.maps.arcgis.com>, n.d.)
5. The food waste is another important reason to be considered when world hunger is observed. It is estimated that annually more than 30% of the global food production is wasted and it costs the world economy approximately \$750 billion annually. In order to overcome the problem with the waste of food implementation of strategies like planning the quantities of food we are buying, and/or freezing the excess of prepared meals ahead of time would result in decreasing the food waste.

17 Global Goals for Sustainable Development to improve people's lives by 2030 were adopted in 2015 by the global community. One of these goals (Goal 2) refers to Zero hunger and aims to “end hunger, achieve food security, improve nutrition and promote sustainable agriculture, and is the priority of the World Food Programme” (sdgs.un.org, 2020; <https://www.wfp.org>, n.d.)

Most governments have not increased the support levels to recognize the extra costs of COVID-19, e.g., having a family at home, or to need more food, support and resources. Rising rents, other costs combined with declining incomes are key drivers forcing people into homelessness, and this is deepened by the impact of COVID-19.

Furthermore, it was observed that there is a decrease in the implementation of positive activation measures for supporting the vulnerable and excluded categories and involving them in the labor market (<https://www.eapn.eu>, 2020).

The devastating impact of the Corona virus in 2020 condemns poorer groups to unequal access to health and higher risk of disease and death. Accessibility and universality of health services for all groups in all regions has declined, but also affordability, particularly with the increase of out of pocket payments for specific services, i.e., specialist consultancy, chronic ailments, but increasingly related to primary health care services including dentistry in most countries.

During the COVID-19 pandemic, prices of retail food and essential goods are rising, to compensate for the reduced numbers of customers. It affects the poorer households. The reduced incomes and extremely increased prices of essential products, contribute to greater poverty of poorer households or put them in a situation of choosing between essential products, such as food, medicine, heating, and medicine.

Energy poverty is the result of a combination of inadequate incomes, high energy prices and energy consumption. With the COVID-19 crisis, a perfect storm is created by reducing household income, increasing energy consumption with social distance and rising prices (<https://www.eapn.eu>, 2020).

Putting an end to hunger and malnutrition is a very important issue to be considered from several aspects because first of all it will improve the health of poor population, which on the other hand would lead to progress in other important areas such as the education and employment. It can be achieved by providing relevant and lasting solutions for each of the four main reasons for world hunger as listed above in the text (poverty, climate changes, wars and conflicts and food waste). The solutions should emerge from the mutual efforts and collaboration among the governments, private companies and individuals across the nations worldwide (wfp.org, 2019).

Child hunger and poverty and their impacts on children

In order for a child to have a chance for a bright future, they need to eat healthy meals every day. When they are hungry, children are more likely to be hospitalized, and they face a higher risk of health conditions because they have weakened immune systems. A brain starved of vital nutrients is one that cannot concentrate, setting hungry kids up for failure in school. The lack of food or improper nutrition can cause various setbacks that can derail children's way out of poverty. Even if the children consume the adequate amount of food, they may not receive enough of the vitamins and minerals necessary for growing up healthy and are therefore malnourished. A total of 47 million children under the age of 5 are wasted, 14.3 million are severely wasted and 144 million are stunted, while 38.3 million are overweight or obese.

According to new mortality estimates released by UNICEF, the World Health Organization, the United Nations Population Division, and the World Bank Group, an estimated 6.3 million children under 15 years of age died in 2017, or

1 every 5 seconds, mostly of preventable causes (worldbank.org, 2018). The vast majority of these deaths, about 5.4 million, occur in the first five years of life, with newborns accounting for around half of the deaths. Globally, in 2017 the situation was the most critical in sub-Saharan Africa because half of all deaths under five years of age took place in sub-Saharan Africa and another 30% in Southern Asia. Also in sub-Saharan Africa, 1 in 13 children died before their fifth birthday, whereas in the high-income countries, that number was significantly lower, i.e., 1 in 185 (UNICEF, 2021).

For children everywhere, the riskiest period of life is the first month. The data have shown that 2.5 million newborns in 2017 did not survive in their first month after birth. The likelihood of surviving in the first month after birth for a newborn baby in Sub-Saharan Africa or in Southern Asia was nine times less than for a newborn baby in a high-income country (UNICEF, 2018).

Most children under five die due to preventable or treatable causes such as complications during birth, pneumonia, diarrhea, neonatal sepsis, and malaria (UNICEF, 2018).

The mortality rates of children under five years old in rural areas are about 50% higher than the respective ones in the urban areas. Furthermore, it was noticed that the level of education has great influence on the mortality rates of children under five. In cases when the mothers are with secondary or higher education the likelihood for surviving of the newborn before it turns five is more than twice compared to the newborns of uneducated mothers (<https://www.unicef.org/angola>, 2021).

However, the statistics for the recent years have shown that, at global level, the number of births has increased whereas the number of child deaths is significantly decreasing. Namely, this number was more than halved in 2017, when there were 5.4 million child deaths, compared to 12.6 million in 1990. The number of deaths in older children aged between 5 to 14 years decreased from 1.7 million to under a million in the same period (<https://ourworldindata.org>, 2021).

For the reduction of child mortality, UNICEF (2018) insists on simple solutions such as medicine, clean water, electricity and immunization. The WHO gives priority to providing universal access to quality health services for every child, especially around the time of birth and the early years (WHO, 2018). The UN believes that reducing child mortality depends on reducing inequality by helping the most vulnerable infants, children and mothers (IISD, 2017).

According to the Lancet report ([thelancet.com/journals](https://www.thelancet.com/journals), 2020), it was estimated that as a consequence of the COVID-19 pandemic, both disrupted health services and decreased access to food could indirectly cause more deaths of children under five. In the most pessimistic scenario, it is expected the wasting to increase by 50% which could “lead to an additional 1,157,000 preventable child deaths” (<https://www.wvi.org>, 2020).

The COVID-19 pandemic is exacerbating existing inequalities, hitting the poor and most excluded hardest and pushing new people into poverty – women, children and young people, single parents and larger families, people with disabilities and chronic health problems, migrants, black and ethnic minorities including Roma and the homeless. It is widening the gap between richer and poorer countries, and particular between the rural and urban regions. Furthermore, the inequalities in health services across countries and the lack of universal access to affordable health and care are being even more noticeable during the COVID-19 pandemic. Poverty is a key social determinant. Commitments must be made to extend free coverage of health and social services to all, with access to targeted additional services for vulnerable groups. Therefore, a comprehensive approach to health, care and social services is of great importance. COVID-19 is increasing inequality in education and lifelong learning (LLL) systems particularly through digital exclusion with shortages of computers and lack of access to the internet, leaving poor and vulnerable children and young people further behind and contributing to increased intergenerational transmission of poverty. Having in mind the above mentioned consequences of COVID-19 with respect to poverty and hunger, there is a necessity for policy proposals with a clear social impact assessment at global level (<https://www.eapn.eu>, 2020).

The UN also estimates that COVID-19 pandemic could push an additional 42-66 million children into extreme poverty. Because of the closed schools there are 368 million children that were not able to access school meals programs (<https://www.wvi.org>, 2020).

Current statistics show that “[...] one in five of the world’s poor are not reached by social safety nets and 65% of children are not reached with comprehensive social protection programmes” (<https://www.wvi.org>, 2020). In the same study the estimations have shown that about 110 million children across the Asia region are starving and 8 million children “have been pushed into child labor and begging because of the pandemic” (<https://www.wvi.org>, 2020).

According to the results from surveying Venezuelan refugees and migrants every third child is going to bed hungry. Overall, it is potentially more than one

million children. The pandemic made it difficult for parents and guardians to provide their children with healthy nutritious food or buy necessities such as medicine and hygiene products (<https://www.wvi.org>, 2020).

Breaking the cycle of malnutrition and poverty

UNICEF has reported that “good nutrition can break this vicious circle of poverty and malnutrition in a single generation. With healthy food, even children with malnourished parents can grow up to reach a healthy weight” (Tradecorp, 2021).

The United Nations Declaration of the Rights of the Child (Humanium, n.d.) contains 10 principles with regard to the obligations of the countries towards their most vulnerable citizens. Herein, the Principle 4, which focuses on children’s health and nutrition, should be highlighted: “The child shall enjoy the benefits of social security. He shall be entitled to grow and develop in health; to this end, special care and protection shall be provided both to him and to his mother, including adequate pre-natal and post-natal care. The child shall have the right to adequate nutrition, housing, recreation, and medical services.”

According to UNICEF’s 2019 report “The State of the World’s Children”, the face of malnutrition has changed. “One-third of children under the age of 5 are malnourished – stunted, wasted or overweight – while two-thirds are at risk of malnutrition and hidden hunger due to the poor quality of their diets” (UNICEF, 2019b).

There are a number of social and economic reasons that exacerbate malnutrition. These, among others, include the marketing of food products. UNICEF suggests that the legislation in each country should be aimed at reducing the marketing of “junk food” and sweetened drinks. There are also calls from the World Health Organization for a promotion of better nutrition and regulation of the marketing of unhealthy food for children (Foodnavigator, 2020).

Accelerated progress to end poverty and hunger by 2030

Among the Sustainable Development Goals, poverty and hunger by 2030, the world has made significant progress since setting the Millennium Development Goal to halve poverty and hunger between 1990 and 2015.

Poverty in developing countries has halved since 1990, with an ongoing push to halve hunger by the end of 2015. Poverty and hunger prevalence in developing countries declined to 21% and 15% of the population, respectively, by 2010. Overall progress has been uneven, with a lag in low-income countries, where poverty and hunger prevailed in 2010 in 48% and 28% of the population, respectively. In addition, more progress has been made in reducing undernourishment (providing adequate amounts of available dietary energy) than in reducing undernutrition (underweight and micronutrient deficiency). Knowing that there is still a great number of people living in poverty and suffering from hunger, the new Sustainable Development Goals include ending poverty and hunger by 2030. To achieve these goals a significant acceleration of progress and support, particularly in low-income countries is required (worldbank.org, 2015). It should be noted that the approach used for achieving these goals should differ for different countries. Namely, in some of the extremely poor countries with low initial levels of agricultural production, income gains and food production the growth will be of great importance for reducing the hunger; but where hunger rates remain significantly high despite the low poverty rate, a more targeted and direct approach to improving health outcomes is needed. Ending poverty and hunger by 2030 will require higher incomes and productivity growth of the poorest groups, but only this will not be enough. Also social norms have an impact (World Bank, 2015).

Feeding every person, every day, everywhere, with a safe, nutritious, and affordable diet will require a multi-sectoral approach that includes but extends beyond raising incomes. In that direction, it is very important to enable production of sufficient quantities and diversity of food by using different type and scale of production depending on the country. The food globally is produced on small, medium, and large farms. Worldwide, there are approximately 500 million small farms (Lowder Skoet, & Raney, 2016) and it was estimated that they produce most of developing world's food (International Fund for Agricultural Development [IFAD], 2021). Smallholder production will still be the dominant form of production in developing countries by 2030, and it is important that smallholders be able to participate in advances in productivity. Overall, about 85% of food is produced in the country where it is consumed.

Among smallholders, commercially oriented farmers deliver surpluses to food markets, but many others are subsistence-oriented farmers, many of whom are net buyers of food. This heterogeneity also permeates local traders, retailers, and wholesalers with both large-scale and small-scale operators. This diversity will

persist to 2030, and the policy environment and associated public investment need to recognize and support this diversity (worldbank.org, 2015).

For the poorest countries, income growth helps reduce the prevalence of calorie deficiency, and in most countries, agricultural growth plays a key role in this income growth. Incomes also affect child undernutrition. Estimates based on past experience indicate that 60% increase in per capita incomes could reduce current stunting and underweight prevalence, by about 35% and 45%, respectively.

Income growth remains vitally important for ending hunger by 2030, and income growth for the poorest will need to come from higher agricultural productivity and better links to markets.

The positive and significant impact of remittances on financial development in beneficiary environments is appreciable, especially in long-term.

The usefulness of microfinance lies in its ability to improve family budgets and stabilize small local production companies, but does not claim to fight effectively against poverty. This statement makes us understand thus that in addition to the use of these tools, a stable financial situation and a rigorous organizational structure are required. These are necessary prerequisites for optimal provision and exploitation of type of service, unfortunately most MFIs in the poorest countries like Sub-Saharan Africa do not have them.

Finally, microfinance tools provide sources to an economic development acting as a solution to vulnerabilities in the rural world. This serves to shelter from climate shocks that could affect productive investment and make farmer's economic suffering (Roettger, 2015).

The financial services can be used by the agricultural sector for farming as well as farm-related activities along the entire value chain, for example, input supply, agricultural production, processing, wholesaling, and marketing. As suggested by the African Union (AU) and Making Finance Work for Africa (MFW4A) agricultural finance can be defined as "finance related to agriculture-specific risk" (Making Finance Work for Africa [MFW4A], n.d.).

We must remember that besides working capital or asset loans for farmers, traders, or processors, it can also include crop or livestock insurance or leasing agricultural equipment. This field of application, indeed, provides financial services for farming, farm-related activities, or activities with agricultural-related risk for low-income clients, which could be smallholder farmers as well as small-input providers or small buyers and traders of agricultural products.

In addition to income, investments in nutrition specific and nutrition-sensitive interventions will also be needed, together with ensuring food availability and stability, particularly in the time of more extreme weather precipitated by a changing climate. But where hunger rates remain stubbornly high despite a low poverty rate, a more targeted and direct approach to improving health outcomes is needed. Social norms also play a role. To feed every person, every day, everywhere, with a safe, nutritious, and affordable diet, will require a multi-sectoral approach that includes but extends beyond raising incomes.

Targeted nutrition programs and nutrition-sensitive interventions need to be expanded. Targeted nutrition programs are a key element of efforts to end stunting and wasting. One study has shown that scaling up 10 proven effective nutrition-specific interventions in 34 countries that have 90% of the world's children with stunted growth could reduce child stunting worldwide by 20% and the prevalence of severe wasting by 60%. Increasing the nutrition sensitivity of other investments in agriculture and social protection programs can also help significantly. Nutrition-sensitive interventions in agriculture include a focus on women, access, availability, and knowledge.

For agriculture, these interventions include:

- investing in women to safeguard and strengthen their capacity to provide food security, health and nutrition for their families; increasing the access and availability of high-nutrient content food through the year,
- improving nutrition knowledge among rural households to enhance dietary diversity⁵; and
- incorporating explicit nutrition objectives and indicators into agricultural investments.

Closing the gender gap can improve yield and nutritional outcomes. Women are key players in the agricultural sector, accounting for 43% of the global labor force and over 50% in some countries in East Asia and Sub-Saharan Africa. But across all regions they own less assets (land, livestock, and human capital) and less access to inputs (seeds, fertilizer, labor, and finance) and services (extension and insurance) than men. Ensuring that women have the same access to assets, inputs and services in agriculture as men could increase women's yields on

⁵ Evidence shows that when diets are extremely undiversified, additional calories have no effect on reducing child malnutrition and that dietary diversity likely moderates the link between income growth and reductions in malnutrition.

farms by 20-30% and potentially reduce the number of hungry people by 12-17% (FAO, n.d.).

Ensuring food availability and resilience to more weather extremes is fundamental. Food demand is projected to increase by at least 20% globally over the next 15 years, with future demand growth increasingly concentrated in cities as the world urbanizes and through increased demand for resources required to produce diets that are more intensive in animal-based products. Most of the increase in world food demand will be in developing countries, increasing by about 30% in Asia and by about 60% in Sub-Saharan Africa, closely corresponding to the required average income gains of the poor in these regions. Concurrently, global diets are shifting – with more consumption of meat, fish, dairy products and fruits and vegetables. The largest increase in food demand is expected in the poorest regions, where climate change is projected to reduce crop yields by 15-20% if temperatures rise above 2°C (World Bank, 2015).

As noted by the World Bank (2015) “Climate change adds a significant challenge of providing enough food to feed the world by 2030. The world needs a more resilient food system that can better withstand climate shocks and longer-term adverse changes in agro-climatic conditions to ensure food is available to meet shifting levels and composition of global food demand.” The global food system is already facing a higher frequency of weather extremes and fundamental shifts in seasonality, all of which have negative impacts, especially for the most vulnerable. Weather extremes contributed to three world food price spikes between 2008 and 2012 and the frequency of extreme weather events is projected to increase.

In 2020, the COVID-19 pandemic erupted across Europe (and around the world), immediately impacting people’s lives and livelihoods, exacerbating poverty for those already facing hardship and exclusion, whilst pushing new groups of people into poverty. This year, a specific focus is on COVID-19. It will generate more poverty and social exclusion, however, no estimates have been publicly made so far in the EU.

In April, a very serious warning from the World Food Programme (WFP) was issued that the COVID-19 pandemic could “push an additional 130 million people into a hunger crisis, leaving 265 million in need of lifesaving food security assistance.” (wvi.org, 2020).

Case studies

Hunger and undernutrition in Democratic Republic of Congo (DRC)

The data obtained from the 2020 Global Report on Food Crises indicate that the Democratic Republic of Congo (DRC) has faced the second-worst food crisis in the world in 2019, having 15.6 million people suffering “crisis” or emergency levels of acute food insecurity (<https://www.wfp.org>, n.d.; [globalhungerindex.org](https://www.globalhungerindex.org), 2020).

In the text below, the child stunting and child wasting as indicators for chronic undernutrition and acute undernutrition, respectively, will be observed. The child stunting in DRC remains high. The data obtained for 2001 (44.4% stunted children) and for 2017-2018 (41.8% stunted children) indicate that there is no significant declining of this indicator at national level since 2001. This is a very serious issue to be considered by respective institutions. The child wasting, however, has decreased noticeably from 15.9% in 2001 to 6.5% in 2017-2018 (Global Hunger Index, 2020a).

The mortality rate for children under the age of five decreased although is still higher than the respective average rate for the region. As of 2018 child mortality in DRC was 8.8%, down from 16.1% in 2000, but still worse than the 7.8% average for Sub-Sahara Africa. Due to the Congolese wars (1996-1997 and 1997-2003) infant mortality increased (Global Hunger Index, 2020a).

Regarding the frequency of the meals and diversity of diet of the people in DRC, they are both not sufficient. The people usually eat staple crops like cassava, maize and rice. They also often consume beans and palm oil, whereas meat, fish, eggs and dairy products are consumed very rarely (<https://fewsn.net/>, 2019).

Water, sanitation, and hygiene are inadequate, contributing to malnutrition and poor health. Just 33% of Congolese have access to improved sanitation, 59% – to improved sources of drinking water, and 22% have hand-washing facilities with water and soap in the home, which poses a challenge to effectively prevent the spread of COVID-19.

According to Global Hunger Index (Global Hunger Index, 2020a), there are several recommendations that need to be considered for overcoming the poverty and hunger in the Republic of Congo. They are as follows:

- The food and nutrition security can be achieved by enhancing the security situation in the country.

- For a comprehensive response to food and nutrition insecurity the capacities of governmental institutions should be strengthened.
- The food security can be significantly improved by increasing the agricultural production and productivity.
- Nutrition education should be enhanced.
- A greater access for adolescents to family planning and reproductive health services is recommended.
- Capacity building and institutional reforms are necessary for enhancing the hygiene.
- Help from the humanitarian and development organizations for detecting the reasons of hunger and poverty, and support for overcoming the current situation related to both, is more than necessary.

What Nepal has done in addressing hunger

One of the main challenges for Nepal nowadays are poverty and inequality although lately this situation has been improved. GDP per capita in Nepal was only \$1,034 in current US dollars as of 2018, the third-lowest level in Asia (Asian Development Bank, n.d.). Since 2019, 39% of the population lived in poverty at or below \$3.20 per person per day, while 8% of population of Nepal was estimated to live in extreme poverty at or below \$1.90 per person per day, down from 50 % living in extreme poverty in 2003 (Asian Development Bank, n.d.). This reduction is due to several reasons:

- increase in international migration, which has driven up wages for the remaining working population in Nepal,
- increase in remittances sent to the country since the late 1990s,
- decrease of the fertility rate and average household size.

Similarly, the data obtained for the Multidimensional Poverty Index (MPI) show a decrease from 59.4% to 28.6%, when the years of 2006 and 2014 are compared, respectively (Global Hunger Index, 2000b).

Hoping to improve their initial economic conditions, young people and sometimes entire families emigrate from the countryside and rural areas. Emigrants to foreign countries often send money to their families of origin; the behavior is defined as financial remittances. These serve as a guarantee and allow the family

access to microfinancing which enables them to improve the agricultural production equipment, housing, health and education. Vulnerable households need more savings and insurance services than traditional financial products. Usually the remittances are immediately consumed by the family members and local communities in the form of food, as well as school and health expenditures.

Remittances, received regularly by households, generate savings, which are often accumulated in the form of livestock. However, sometimes families allocate their savings to activities that are not strictly related to agricultural production, this is the case when they decide to save to allow another family member to emigrate. This may often be perceived as the best investment of all, as other migrants could find their expenses considerably reduced while increasing the savings capacity of the beneficiary household in the future. Despite their large volume, remittances can only integrate all efforts addressed to sustainable development. It is important to share potential savings resulting from remittances, both formal and informal, because thanks to their use it is possible to obtain possible economic development of the rural environment (Migrantes Refugidos, n.d.).

Nepal's 2020 Global Hunger Index score is 19.5, which is considered moderate, less than 37.4 in 2000, showing that despite improvements, food and nutrition insecurity is still a cause of concern. The prevalence of undernourishment – the percentage of the population with insufficient access to calories on a regular basis – fell from 23.6 % in 2000-2002 to 6.1% in 2017-2019. 75% of the cultivated land in Nepal is occupied by cereal crops. Challenges to achieving food and nutrition security include natural disasters such as floods, landslides, and earthquakes; climate change; poverty; poor infrastructure, particularly in remote and mountainous areas; urbanization and outmigration, leading to the feminization of agriculture and volatile food prices (Global Hunger Index, 2020b).

According to the Global Hunger Index data (Global Hunger Index, 2020b) for the period of 1995-2004 in Nepal showed that the increase in the agricultural productivity led to an increase in household food security, particularly for lower-income households. These beneficial outcomes are a result of the implementation of various agricultural programs, as well as home and school gardening programs in Nepal. Some of them, such as the planting of different maize cultures in Nepal, contributed towards increasing the number of months of food security. Also, due to the improvements in the homestead food production programs, including the home gardening, poultry raising, and nutrition education, the anemia among children aged 12-48 months and their mothers was reduced.

A noticeable decrease of the mortality rate of children under-five in Nepal was observed from 1980 to 2000 when the respective mortality rate decreased by 12.7 percentage points, whereas from 2000 till 2018 the decrease of the same rate was about 5 percentage points. The rates of child stunting and child malnutrition also followed the trend. Nepal's rate of child stunting, an indicator of chronic undernutrition, decreased significantly from 57.1% in 2001 to 36.0% in 2016, though it is still unacceptably high. Concerning the rate of child malnutrition, depending on the region it varies from 32.3% to 46.8%. The higher rates of child stunting refer to the mountain regions in Nepal because of the poor access to nutrient-dense foods and low dietary diversity. Women's empowerment in agriculture – specifically their access to credit decision making, satisfaction with leisure time, and autonomy in production decisions – is also associated with greater children's height for their age. Also, Nepal's child wasting rate, indicating acute undernutrition, declined modestly, from 11.3 % in 2001 to 9.6 % in 2016.

A noticeable progress with respect to reducing the child mortality in Nepal was also observed. It was achieved by great improvement in the child health interventions in terms of recognition and treatment of acute respiratory infections, routine immunization, control of diarrheal diseases and malaria, vitamin A supplementation as well as family planning. After the period of 1991-2011 the reduction in child mortality was due to the higher coverage of semiannual vitamin A supplementation, community-based integrated management of childhood illness, higher rates of child immunization and promotion of exclusive breastfeeding of newborns under six months of age, as well as improvements in nutrition, hygiene services, health care facilities, education and infrastructure (Global Hunger Index, 2000b)

Regardless the previously listed improvements, Nepal is extremely vulnerable as far as COVID-19 pandemic is concerned. The country, as many others, is facing limited resources and conditions for proper treatment of the patients, such as ventilators, hospital isolation units, and personal protective equipment due to its tight budget position and still-developing governmental structures.

Conclusions

The scale of socio-economic crises caused by the global pandemic requires the joint efforts of all actors in the global system in addressing the underlying drivers of poverty and vulnerability at the global, national, community and household levels. The recommendations refer to the following:

- Strengthen and/or establish national child protection social systems, ensure adequate budget allocations and establish accountability mechanisms to ensure that the most vulnerable children receive transfers of sufficient size and duration to meet life-saving needs and nutrition.
- Maintain functioning food and agriculture market systems. Prioritize rapid analysis, response, and adjustment of the food and agricultural products market. Policies should support continued global, national, regional and local trade in commodities. Priority should be given to supporting smallholder livestock owners, pastoralists and agricultural workers in accessing finance, purchasing agricultural and livestock materials and selling their crops in the markets. This, in turn, will help maintain food supply chains between rural, peri-urban and urban areas and within and between countries. Another challenge is to ensure that people along the food supply chain are not at risk of transmitting COVID-19 by raising awareness of food safety and health regulations, including rights, roles and responsibilities (reliefweb.int, 2020).
- The world community needs to be more active in preventing and combating hunger and poverty. People are hungry even when there is enough food because there is an unequal distribution of food and a lot of political unrest in the world. Work needs to be done to find a sustainable solution to eradicate hunger and poverty.
- Bad agricultural practices, deforestation, logging and deforestation that deplete land fertility and cause famine need to be eradicated.
- Wars are another fundamental issue for poverty and hunger that needs to be addressed as millions of people are displaced from their homes, leading to famine and poverty (ukessays.com/essays, 2017).
- The peoples and governments of the countries concerned have the main responsibility for achieving the aims of reducing hunger and poverty. However, countries with widespread extreme poverty and malnutrition cannot raise the resources domestically to directly assist the needy and to foster growth in the productive sectors. These countries cannot make progress in the battle against hunger and poverty without a sustained flow of external resources (fao.org, 2015).
- FAO, IFAD and WFP emphasize the need for concessional funds and grants appropriate to the situations of recipient countries, which has been noted in the review of international cooperation being prepared for the international conference on financing for development.

- Developed countries, supported by international trade institutions, have an opportunity to demonstrate their willingness to make significant contributions to hunger and rural poverty eradication. They can open their markets, especially to agricultural exports from developing countries, reduce subsidies on farm production, share technology and assist developing countries to take advantage of expanded international markets.
- Civil organizations, especially international and national NGO-s operating in developing countries, must commit themselves with renewed vigor to addressing the problems of hunger and rural poverty. They have important roles in mobilizing resources and providing technical services and advocacy (fao.org, 2015).

KEY TERMS

Poverty, hunger, malnutrition, child mortality, undernourishment, undernutrition.

SUBCHAPTER SUMMARY

In this Subchapter the issues of hunger and poverty, how they are measured, to what extent they affect the world population of the economically most backward countries are addressed. Many cross-country poverty studies measure the poverty using the criterion of those living on less than US\$1 a day – the threshold defined by the international community as constituting extreme poverty. In the text specific economic tools in order to succeed in alleviating these situations of economic and social hardship are offered.

At the EU level, the Europe 2020 strategy set a target to reduce poverty by at least 20 million by 2020, which has not been achieved. The UN believes that reducing child mortality depends on reducing inequality by helping the most vulnerable infants, children, and mothers.

The COVID-19 pandemic is exacerbating existing inequalities, hitting the poor and most excluded hardest, and pushing new people into poverty.

This Subchapter easily explains how important and fundamental it is to develop tools aimed at reducing poverty, especially in countries where people live below these thresholds.

The goal is to explain how the vicious circle of malnutrition and poverty can be broken and how, by using different approaches for different countries, zero poverty and hunger could decrease by 2030, in order to achieve Sustainable Development. The Subchapter also contains case studies of the poorest countries in the world and offers appropriate conclusions for overcoming the global problem of poverty and hunger.

TEACHING METHOD/TECHNIQUE

Online/Distance learning – learning process, which includes learning with the assistance of the Internet and a personal computer.

Rounds – giving turns to individual students to talk.

Problem based learning (PBL) – students gain knowledge and skills by working for an extended period of time to investigate and respond to a complex question, problem, or challenge.

Case study – a documented study of a specific real-life situation or imagined scenario (Vasiljevic-Shikaleska, Stojanovikj, Kirovska, Kiselicki, & Gjozinska, 2017).

DISCUSSION QUESTIONS

1. Carry out analyses of the situation regarding hunger and malnutrition in your country. Design policy that can result in alleviating it.
2. Find examples of measures undertaken by global/ international organization towards reducing hunger that are or can be implemented in your country.

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2.3.3. Limited access to quality education

Ivica Voloder^a

LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- understand the terms, notions and categories referring to education, education quality and globalization,
- explain PISA tests on the global level,

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- connect expenses for education in a certain society as GDP percentage depending on the pass rate on PISA tests,
- understand rules and recommendations for improvement of educational system in the quality societies in the world.

Introduction

If we want to talk, let's define the terms, firstly.

Voltaire

The educational system of a certain society is considered in the 21st century as one of the main systems with which the society in question competes in today's global world. The logic is simple, in order for a society or a state to be economically more efficient, it is necessary for its inhabitants to be able to create economic added value, i.e., the more educated they are, the more productive they are. Accordingly, the society itself is advanced, competitive and thus richer, etc.

However, when the issue of education is more deeply analyzed, things become a little more complicated, taking into consideration that it is standardly divided in modern society into:

- Pre-school (some countries do not have it, and the richer ones start with it as soon as possible).
- Primary school (more or less compulsory everywhere, but the poorest still cannot organize it for all their children).
- High school (for the rich, this part of schooling is increasingly preparing children for the frantic and relentless race to enroll in higher education).
- Higher education (with frequent division into scientific and professional studies, long ranked world universities have become the main mechanism by which to define the manner and size of their funding).
- Lifelong learning (the part that is becoming a reality for all in the 21st century, it is funded through three sources: developed (richer) countries as a mechanism for adjusting occupations on the labor market, employers investing in employees because they are aware of the fact that employees with up to date knowledge are the only competitors on the market and the citizens themselves who are aware of the fact that many occupations are disappearing in their working life and that they need retraining); often supported and created

by employers, but also by employees themselves, mostly in order to be more competitive on the market.

There are special theories and elaborations for each of them because for each of them education and learning are completely different (approach, way, use, ...) depending on the group (preschool education, primary school, ...), but also due to the fact that people have different psycho-motoric and other abilities during their lifetime.

Besides, there are certain impacts (or *forces*) which support or stop them (negatively affect the entire quality and accessibility of education in a certain society). Some of the forces which affect the education system in a certain society are:

- way of GDP distribution – in economics it is best described with Gini coefficient of GDP distribution,
- percentage of GDP investment in education (infrastructure, administrative staff, teachers),
- competitiveness of teachers and lecturers (in the categories of scientific contribution, but also professional, and special reference to the pedagogical improvement of teaching staff) – method of selection, criteria for promotion, mentoring,
- demography and future population structure, migration/emigration/immigration,
- democracy – freedom of exchange of information,
- development of technology and its availability to target groups in society,
- non-formal education and accessibility of information to the population,
- method of financing education (public – private).

Allocation for education as percent of GDP

In view of education, a lot of similarities can be found in the health system, today the most used economic method when comparing education systems between countries is the mechanism and measurement of the total percentage of GDP that a country spends on education relative to total GDP.

In addition to the OECD, such a measurement is carried out by the World Bank (The World Bank, 2020), and it can provide a good partial answer to the ques-

tion: Why is a system of education in one country more efficient and valued than in another one.

It should be taken into account that this percentage includes the total consumption of the public sector plus the consumption of the private sector. Some countries allocate a lot through the public sector, and private allocation is minor. While, as always with a large amount of different statistical data, the so-called anomalies (e.g., Cuba allocating 12.8%) appear, it is realistic to generate the conclusion that richer countries allocate a higher percentage of their GDP to education from public payments (e.g., Scandinavian countries almost 8% and the US only 5%). The main question that arises when looking at the education system in this way (how much is spent on it or how much it costs) is: Have these amounts achieved the effects in proportion to what was invested?

Quality education – PISA testing

When it comes to the quality of education, two truths are eternal. The first one is that no one can fully define what quality education is – what it should look like (at least all of us who were sitting at school can intuitively immediately recognize who is a good and inspiring teacher and who is not), and the second one is that there is no state that at least rhetorically is not currently engaged in any of the reforms of its education system or has just completed one reform and is already moving into a new one.

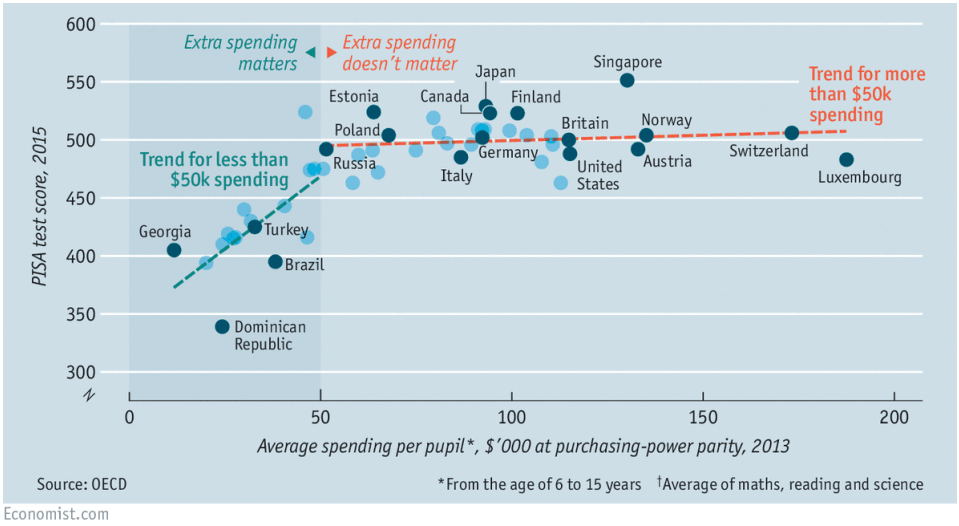
Currently, the world standard at the state level related to describing the quality of education are the so-called results of PISA tests (<https://www.oecd.org/pisa/publications/pisa-2018-results.htm>). The Program of International Student Assessment (PISA) are tests in science, math, and reading skills for 15-year-olds from around the world, published by the OECD (a group of wealthy countries). On average, over 540,000 students from 72 countries pass the tests. For example, the average score is 490 points, and 30 points above that average means the end of one school year on average.

There is a lot of criticism of this testing, which is a common case when someone publishes a test and conclusions, especially from those environments that did not go well in them. There are various reasons why these results are not good, from cultural, formal, economic viewpoints, but the fact is that there is no better, of higher quality and more extensive (global) examination.

It is well known that many rich and developed countries are at the top of that ranking, based on which it can be concluded by the layman how easy it is to have a good education system if you are rich and have enough funds to invest in it. As the differences between countries regarding wealth are not greater today, it would be correct to take a closer look at how the results on PISA tests look depending on the amount of public spending per student.

It is pointed out that among poorer countries, the amount of public spending per student is associated with higher test scores. But in richer states that spend more than about \$ 50,000 per student between the ages of 6 and 15, this link does not prove this (Figure 2.59). Students in Poland and Denmark actually have the same average scores in science tests, although Denmark spends about 50% more per student. Therefore, today it is very well observed which reforms are effective in terms of how much money will be spent on what, in relation to the results that will be achieved through this additional cost. To comprehend this, the whole world has been observing for years the two highest quality education systems of the states of Finland and Singapore.

Figure 2.59. Spending per pupil and PISA test results



Source: OECD data after *The Economist* (2016).

Finnish and Singaporean models – the world’s most successful models

Having observed the past few testing cycles (the latest results are from 2018), the two countries have been alternating in the first places for years – Singapore and Finland – and have become a model for all other countries in the world, Finland to western countries, and Singapore to countries in the Far East.

The education system in Singapore is considered the best in the world today. It is a country that is consistently at the top of the OECD Program of International Student Assessment (PISA), a three-year test for 15-year-olds in dozens of countries, in the three main categories of mathematics, reading and science. Singapore is an island nation that can learn a lot from the rest of the world. But other countries have relatively poor students. One reason is that Singapore favors traditional pedagogy, where teachers teach (*The Economist*, 2018b). The criticisms related to the Singapore model regarding too much stress among students (up to a high suicide rate among students who did not enroll in the desired schools), is no longer relevant because Singapore education went through a “silent revolution almost unnoticed in the West.” “It’s not just about teaching how to be smart, but also about how to be a better person” (*The Economist*, 2018b) enthused Heng Swee Keat, the state finance minister, who was in charge of education between 2011 and 2015 (*The Economist*, 2018a). Singapore has drastically eliminated stress in the last ten years, as their main goal has been to bring back smiles and reduce stress and frantic competition for enrollment in better schools for students.

The most noticeable changes so far have been in the reduction of pressure on children taking exams. For example, exam questions have been transformed into more open ones, to encourage critical thinking as well as subject knowledge. Teacher grades measure not only academic success but also the social development of students. They also changed teaching methods. All teachers receive 100 hours of training per year. They learn new pedagogical techniques that encourage group work and discussion between teachers and students.

The goal of their reform was to align the classroom with future places with the new changes. The plan is that by 2023, almost all schools will have “applied learning” programs in subjects such as computing, robotics and electronics, but also drama and sports. The emphasis in all of them is on practicing in a “real” environment; without exam.

Regardless of the wishes of the legislator, some habits are hard to change. Many children still receive additional lessons after school, all because of the stress that is very often produced by the parents.

Perhaps the most important thing the world can learn from Singapore is to focus on developing excellent teachers. In Singapore, teachers have 100 hours of training per year to keep up to date with the latest educational and pedagogical techniques. In addition, they are well paid, and even the private sector cannot often compete with them. It is normal for the number of students in a class to be higher (the average is 36 students, compared to 24 in the OECD). Their thinking on this issue is simple – it is better to have large classes taught by excellent professors and teachers than smaller ones taught by mediocre professors and teachers.

On the other side of the world, Finland has become the most successful for much of Western civilization and its education system has been copied by others upon their start-up of education system reforms.

Educators landed in Helsinki. They reported that not only was the education free and comprehensive, but the teachers were highly respected, well-trained, and left to continue their work, which often included allowing children to discover things for themselves. International visits became so popular that the Finnish government began charging for them. Those who come today pay more than 1,200 euros (\$1,300) to visit the school.

Nevertheless, there are still many similarities in the organization of Finnish education systems. There are very few schools that charge tuition, and the main goal is to try to reduce exams. Related to this is the organization and creation of continuously new curricula, which began to be introduced in 2016, which encourages teaching without completely specific subjects (a large number of “subjects” could be said to be multidisciplinary). The words of a school principal from Tallinn, from the neighboring Finnish state of Estonia, best describe what their first priorities are: “the first priority is the happiness of the students, and the second is to help them cope better in the world the school prepares them for” (*The Economist*, 2019)

A unique conclusion, for both states that have the best results, is that they focus their time and effort on what is happening in the classroom, rather than on the formal structure of the school system.

Education in poor country

On the other side of the planet, in the world's poorest countries, the story is completely different. Education in most developing countries is shocking. Half of children in South Asia and a third of children in Africa who complete a four-year school cannot read properly. In India, 60% of children aged six to 14 cannot read at the level of a child who has completed two years of schooling. Very often they do not talk about the quality, but is there an education system at all?

In the slum in Mathare (Nairobi) where over half a million people live, there are only four public schools. Therefore, it is not surprising that the private initiative has made their impact, so that there are already more than 120 private schools. This pattern is repeated in Africa, the Middle East, and South Asia. The state's failure to provide children with decent education leads to growing private sites, which can cost as little as \$ 1 a week (*The Economist*, 2015). This is the main reason why private schools are flourishing in poor countries. Millions of parents who send their children to these schools welcome it because they see nothing better for their children.

Politicians and educators are generally not enthusiastic. Governments see education as the job of the state. Teachers' unions do not like private schools because they pay less and it is harder to organize them. Non-government organizations tend to ideologically oppose the private sector. UN Special Rapporteur on Education Kishore Singh said "profit-making education should not be allowed to protect the noble goal of education" (Singh, 2014).

This attitude harms those whom educators claim to serve – children. The sharp rise in private education is a great news for them and their countries for three reasons:

First, it is making money – not only from parents, but also from investors, some in search of profit. Most private schools in the developing world are sole operators that charge a few dollars a month, but now groups of schools are emerging. For example, Bridge International Academies have 400 kindergartens and primary schools in Kenya and Uganda that teach in standardized classrooms that look pretty much like complex shipping containers. It is planned to expand to Nigeria and India. Mark Zuckerberg, the founder of Facebook, Bill Gates and the International Finance Corporation, a branch of the World Bank's private sector, are among its investors. Groups represent a healthy development because they must be preserved.

Secondly, private schools often offer more value for money than public ones. This is difficult to measure because children who go to private schools tend to be better off and thus have better performance. But a rigorous four-year study with 6,000 students in Andhra Pradesh, southern India, suggested that private students did better in English and Hindi than public school students, and were at a similar level in math and Telugu (the name of the local language). Private schools achieved these results for a third of the cost of public schools.

And finally, private schools are innovative. They adapt much earlier to, for example, IT technology that has exceptional future potential in education. Through it, teachers are connected to a central system that provides much better teaching materials, but also partially monitors their work. Such semi-automated teaching may not be ideal, but it is better than teaching without materials and/or supervision (Figure 2.60).

Figure 2.60. Schools for a dollar per week



Source: <https://inhabitat.com>

Critics of the private sector are right when they cite the following issues – quality ranges from a top international standard to much more than cheap childcare. But the alternative is often a public school that is worse – or when there is no school at all. The growth of private schools is a manifestation of perhaps the

healthiest human instinct – the desire of parents to do the best for their children. The fact is that at least most governments in these poor (predominantly African) countries have promised to provide universal primary education and promote secondary education. However, the same government, teachers' unions and NGOs are inclined to believe that private education should be discouraged or strictly regulated. Unfortunately, this is not realistic in poor countries. In the future, this is something which apparently will change in itself as societies get richer. Therefore, governments that are too disorganized or corrupt to encourage this trend should be removed from such a path and as long as they do not have the strength and will not actively change something, this type of education should not be hindered. According to the World Bank (n.d.), one-fifth of the world's developing primary school students are enrolled in private schools, twice as many as 20 years ago.

Distance education – online access – opportunities and limitations

In the not-so-distant past, investments in educational IT technology often failed due to poorly specified hardware and clumsy software, which deterred potential users. But, as with many other things, the closure of the world generated by the COVID-19 pandemic has put additional pressure on schools, parents and students to embrace innovation from the IT sector. The fact is that most of the software from Microsoft Teams, Google's Classroom, Zoom, Skype, etc., existed ten years ago. The question is whether their moment has arrived? The answers to that question may vary and depend on the particular state. The answer is completely different for India or Greece, for example.

India has had a highly developed IT software industry for years, so when COVID appeared, ClassKlap flourished. Their IMAX package – a combination of software for students, teachers and parents – has been sold in more than 1,200 budget private schools. It includes applications for children learning at home, applications for teachers and programs to improve skills and lesson planning, even tools for school principals to better manage their work. The problem of India are rural places and the reach and bandwidth of the Internet.

More developed countries have different problems with this issue. In Greece, for example, the pandemic proved to be an opportunity for digitalization. Greece was at or near the bottom of the EU list of countries in the digitization category,

whether it is measured in terms of speed and availability of internet connection, number – ownership of laptops and/or tablets, or the size of online purchases. The pandemic in Greece has changed all that. Schools closed again in November 2020 after the second wave of Coronavirus hit Greece, and a new online teaching system was launched two days later. The Minister of Education (*The Economist*, 2021) confirmed that distance learning has been compulsory since then and that new curricula are being conducted online. Teachers who do not show up for an online lecture face disciplinary action. Even as normal life continues in the classrooms, digital learning in Greece will occupy a large part of the educational program.

Services/applications such as Zoom Lectures can accelerate a long-standing trend that is more than obvious today. Online education providers, such as Coursera, have not revolutionized higher education, as was routinely predicted in the early 2010s. But they have created a niche market, mostly by providing instruction aimed at older students. According to all predictions especially after the COVID crisis, a large increase in online education is expected.

More developed countries have different problems with this issue. For example, many still prefer a personal and live lecture. What the future will bring to us: a mix of both. Many education systems will surely be transformed and changed. For example: many campus-based higher education systems where the primary form is physical presence have already either stopped or completely crossed out all their new investments in physical buildings for the medium term. Instead of investing in physical buildings, they are investing more and more in their IT sector. The problem of the development of the online education system is the issue of quality and availability of telecommunications signal. It is usually taken for granted that the issues of software, hardware for users and electricity have been resolved because developed countries, especially urban ones, in principle no longer pose these challenges. However, for rural areas, especially those in less developed countries, it is a completely different issue. How far the reach of telecom operators will be solved through cable or perhaps even via a 5G network, or to the most remote places via a cheap satellite connection (Program Starlink from Space X; <https://en.wikipedia.org/wiki/Starlink>) – where an extremely large number of small satellites would be placed in orbit or some other technology, the future will show. Until then, many rural parts of the world will continue to be cut off or largely limited by opportunities and access to online education.

KEY TERMS

Education, quality of education, PISA testing, education models, public and private education.

SUBCHAPTER SUMMARY

The educational system of a society is considered in the 21st century as one of the main systems which the society is faced with in today's global world. The notion of quality of education is ambiguous and varies greatly from society to society. Today, the most used economic method when comparing education systems between countries is the mechanism and measurement of the total percentage of GDP that a country spends on education in relation to the total GDP, whereas the current world standard, which defines the quality of education, results from PISA tests. Different ranking lists of the "best" universities are used for higher education. The Subchapter describes, among other things, the two most frequently mentioned educational models – Finnish and Singaporean, but also the one dollar school model in the poorest countries in the world. Finally, the questions and challenges await education in the future regarding COVID and online education.

DISCUSSION QUESTIONS

1. What is meant by the quality of education?
2. What are PISA tests and how relevant are they to assess the quality of a system of education?
3. To what extent are the Finnish education model and the Singaporean education model applicable in your country?
4. What are the basic differences between public and private education?

PROPOSED TEACHING METHODS

- lectures,
- guided discovery learning,
- discussion,
- group/team learning.

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2.3.4. Changing demographics.

Impact on human capital

Ewa Wójcik^a

LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- recognize the challenges resulting from demographic changes,
- predict the implications of the changes for business,

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- understand managerial challenges and expectations,
- analyze the needs of employees and suggest ways of meeting them,
- understand the role of intellectual capital in today's business.

Introduction

Labor force is considered to be the major factor in **sustaining** the economy of each country. Substantial numbers of available workers are derivative of the population as a primary factor, age distribution and level of education.

As sustainability involves substitution of resources, such as energy and materials with modern technology and know-how, more capital in the long-lasting assets is needed. Therefore skilled labor and intellectual capital are demanded to ensure development of sustainable industries, infrastructure, business models as well as systems of circular resource management. Long-term macroeconomic policies, e.g., government support to firms should motivate workers to take up more training through public, private, and shared financing and ensure inclusive access to employment to anyone. Sub-optimal use of labor can lower its growth potential. It can result from labor market imperfections, e.g., entry barriers for certain workers, uneven job protection, low bargaining power of certain groups of worker relative to others, discrimination or exclusion from job or training opportunities. Such deficiencies can distort wage setting and lead in turn to sub-optimal use of labour. Imperfections weigh on economies' growth potential and affect labor market segmentation.

Demographic trends and issues

Demographic studies refer to human populations, in particular their size, density and distribution, and vital statistics, such as births, marriages and deaths. They contribute significantly to analyses of economic growth potential because there is interplay between population, in particular the number of workers, the structure of employment and the level of development. Labor force statistics allow for analyses of the situation at present and projections for the future.

All in all, the world's largest population and labor forces are those of China, India and the United States. It is argued, however, that for stable economic development substantial numbers of available workers should be combined with

high GDP. While in the United States and China the factors are connected, India despite of significant number of laborers does not record corresponding high volumes of GDP.

Among the critical challenges of the 21st century to be faced by societies are demographic shifts occurring now and in the near future. Contemporary demographic issues involve population explosion on a global scale and effects of birth control in certain regions, as well as negative population growth, urban congestion and illegal immigration in others.

Although population growth in the world has slowed down, it still translates into bigger numbers. In 2019 the rate of population growth was 1.07% per year while a year earlier it was 1.09% – down from 1.12% in 2017 and 1.14% in 2016 which illustrates a downward trend, particularly impressive as compared to the rates in the previous century (in 1967 at 2.11%).

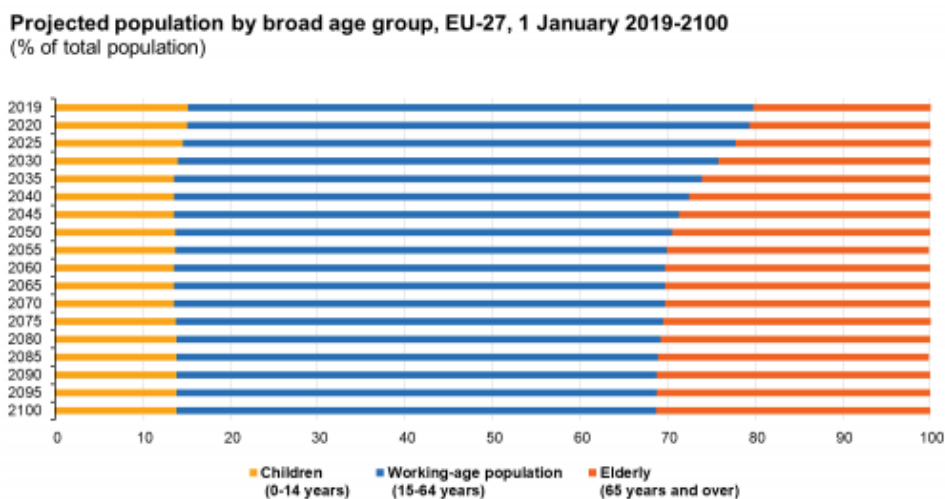
Notwithstanding, the net annual gain was 72 million people in the previous century, while current average population increase is estimated at 82 million people per year, i.e., over 147,000 a day (<http://www.worldometers.info>).

The most serious problem affecting population seems to be its ageing. While in 2015 in the world there were 901 million people aged 60 or above accounting for 12% of the world's population, by 2100 that figure is projected to reach 3.2 billion. In 2030 already, the people aged 65+ are expected to make up a quarter of the global population (United Nations, 2015).

In certain regions the problems facing population are more acute, among them is the European Union. According to estimates, the population of the very old citizens (80 years or older) in the EU, is projected to double by 2080 (from 5.4% in 2016 to 12.7% in 2080). The number of people aged 80 and above will increase to over 66.1 million in 2080. Demographic change will affect shrinking working age population – by 2060 the number of people aged 65+ is expected to increase to 51.6 per 100 people of working age (15-64) from 30.5 in 2019 (European Commission [EC], 2019). Considering the trends Eurostat analyses conclude the EU will have progressively ageing population. Population ageing requires public expenditure on long-term care (LTC) increased substantially– from 1.6% in 2016 to 2.7% of GDP in 2070 (an increase of almost 70%), according to projections (EC, 2018). Such outlays may seriously challenge financial sustainability.

Similarly, the working-age population continuing to decline through 2050 will result in the retirement-age population larger than the working-age population (Figure 2.61).

Figure 2.61. Age groups in the population of the EU



Source: https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=497115#Population_projections

The working population (defined as people aged 20-64) will be shrinking paired with an increasing percentage of people in retirement as more and more people born during the post-war boom reach retirement. In order to guarantee sufficient number of workforce for the economy, it should be assumed that today's as well as future employees will be working much longer than they do now.

The projections of **dependency ratio** which shows the share of population aged 65+ in relation to 20-64 year olds are not promising for the EU. While there were 4.2 people of working age for every dependent person over 65 in 2002, and 3.4 people in 2016 (old-age dependency ratio increased from 23.9% to 29.3%), by 2030 the ratio is projected to reach 39.1%, so there will be fewer than three people of working age for every dependent person over 65.

Another indicator of demographic trends is the median age of workers, which is increasing in the EU-27's population. In January 2019 it was 43.7 years (half of the EU-27's population was older than 43.7 years, while half was younger). It varied across the EU-27 Member States ranging between 37.7 years in Ireland and Cyprus and 46.7 years in Italy (Eurostat, n.d.).

Because of the trends, it is noted, social demography is gaining importance while addressing the relationships between economic, social, cultural, and biological processes affecting the population.

In order to respond to the shifts in the age make-up of societies, and to meet increasing demands of the silver economy significant adjustments in social models and welfare systems should be made. Measures taken to lengthen working lives, avoid a “brain drain” may help sustain pension schemes and enable sustainable economic growth (EC, 2019).

Demographic transition and the needs of the ageing population demand particular efforts towards development of the silver economy, such as specific services and programs for the elderly beneficiaries within social security and medicare. Development of “age sensitive” services, e.g., financial and advisory (capital security, saving, wealth management, planning) should enable integration within societies and between generations.

In the light of the ongoing demographic changes, the group increasingly interested in addressing the intergenerational issues are employers who may be confronted with varying attitudes and clear-cut differences between generations working together. Subsequent generations establish and develop relations increasingly on the basis of connectivity, and therefore assume more global perspective and attitude. They have more in common with their international peers than any previous generation. Moreover, there is an unprecedented need for older generations to assimilate the culture and behavior of the youngest generations to be functional in a high-tech world, leverage technology and remain relevant (Jenkins, 2017). Still with the accelerated pace of innovation diffusion younger generations will always have advantage over the older ones so the latter have to be ready to make up for the shortcomings (Wójcik, 2020).

In 2021 four generations make their presence in a labor market: Boomers, Generation X, Millennials, Generation Z (Table 2.9).

Table 2.9. Generations defined

Generation	Silent	Boomers	Generation X	Millennials	Generation Z
Born	1928-1945	1946-1964	1965-1980	1981-1996	1997-2012
Age in 2021	76-93	57-75	41-56	25-40	9-24

Source: Author’s own elaboration

Generational make-up in the job market is changing as the oldest retire and the youngest mature. It is expected that by 2025 Millennials (gen Y) and generation Z will constitute 75% of the workforce.

The number of Generation Y representatives has just surpassed the numbers of previous generations on the labor market so they have to be considered the most important group of employees. However, Generation Z reaching maturity and appearing in the market has also been the focus of much attention of late.

Intergenerational differences are clear-cut in several ways, as people who lived and attained maturity at varying times in history were formed by specific events. An important generation-shaping consideration is technological development, which defines the ways in which people communicate, interact and work (Wójcik, 2020).

In the context of employment relations, Millennials are the first generation expected to operate in an increasingly multicultural work environment which is more internationally connected by proliferating technologies and to coexist with older ones in the workplace, presumably for a longer period of time. Additionally, they live in the world of intensified migration which demands they are open to cross-cultural issues, tolerant and free from discrimination. Such expectations are likely to be intensified in times of isolation and distance work performed and preferred by young employees.

The trend to Work from Home and/or Work from Anywhere is likely to strengthen during the pandemic as people grow accustomed to the system and recognize its benefits. A survey among 330 HR executives at large U.S. companies about six months after the pandemic hit revealed that one-third expect 40% or more of their employees to work virtually, while 36% say they want to employ staff who are 100% remote. Despite numerous disadvantages of Work from Home (WFH), such as monotony, social isolation, burnout, as well as losses in harder-to-measure benefits of creativity, innovation, teamwork, trust, and empathy, studies show gains in efficiency and productivity. “According to one survey released in 2020, employees working apart from colleagues were most concerned about diminished collaboration and communication, increased loneliness, and being unable to unplug” (Sawhney, 2021).

It is argued that systems based on Work from Anywhere can contribute to organization’s talent pool. They allow for employing workers who live in areas far from the company. The system is referred to as “secure borderless workspaces” or “talent on the cloud” and ensures “every project is staffed by employees with the right skills, no matter where they are” (Choudhury, 2020).

It can be assumed that also the youngest generations are likely to embrace distance work as convenient and eliminating numerous barriers. Generation Z, though the

youngest and therefore the least thoroughly examined, has been identified as diverse, visible and actively involved in markets, following change, constantly connected, multitasking and cross-referencing, preferring broad perspective rather than focus on specific issues, not patient and with attention span hindered by bombardment with information (Table 2.10).

Table 2.10. Generation Z characteristics

Visibility – have taken hold in pop culture and journalism
Diverse ethnically and racially, behaviorally and culturally (more than other generations)
Realm – first true digital natives
Unprecedented degree of connectivity, 24/7 access
“Always on” technologically
Follow accelerated pace of technological changes, adapt behavior, attitude, lifestyle
Do creative jobs, e.g., teaching piano, on YouTube channel (70% of self-employed teens in the USA) often when still at school
Over-rely on technology and social connections in learning, finding answers to questions
Skilled multitaskers (multitask across five devices at a time)
Sense of entitlement
Unlimited trust to the Internet
Shortening attention span, an eight second “attention filter”
No patience, immediate response desired, immediacy – access to social connections, feedback and content
Non-linear fashion of thinking
<i>Constructing</i> preferred to being <i>instructed</i> , <i>seamless</i> technology aided instruction
Prefer global perspective to see issues and trends, look for solutions to problems based on the big picture
“Generalists” rather than “specialists”

Source: Based on: McKinsey (2018), Microsoft (2015), Seemiller & Grace (2015).

Generation Z’s representatives need changing rewards and feedback. Positive challenge can make them thrive as well as an opportunity to present what they have created in public forum, online or in person. Their perspective is broad and the content studied should be relevant on a global scale, brief and simple.

Researchers into this generation (McKinsey, 2018; Seemiller et al., 2015) conclude that acquiring knowledge by this cohort should be based on individual skills and developed by e-learning rather than through formal education. The process is supported by the ease of asking questions through network. This implies also in-work training should be tailored to meet their expectations.

Varying attitudes and expectations of workforce consisting of different generations can be the source of a potential conflict which often contributes to employee’s dis-

satisfaction, decreased efficiency and productivity. “An abundance of practitioner-oriented and mass media articles suggest that inter-generational differences, whether real or perceived, are a potential source of workplace conflict.” (Urick, Hollensbe, Masterson, & Lyons, 2016). As research shows the tensions among generations can have different background and be values-based, behavior-based, and identity-based. Workplace conflict is often defined as discordance between employees resulting from different needs or interests, values, perception or approach when being connected by tasks assigned and thus interdependent. Therefore management functions should embrace conflict by developing strategies and tools to deal with it effectively.

Contemporary labor market characteristics

The most dramatic changes affecting labor markets nowadays derive from the COVID-19 pandemic. Work from Anywhere, the style that existed before has gained pace after lock down and restrictions were imposed. Paradoxically, it can additionally boost sustainability from different perspectives – environmental by reduced commuting, and social resulting from increased employees’ engagement and productivity as they are allowed to stay when they prefer to or even move places enjoying geographic flexibility. For some staff members an important financial prompt might be an opportunity to cut cost of living by relocation to cheaper regions.

Social benefits additionally include support for the disabled by lifting barriers of access to certain locations. Moreover, women facing cultural taboos against travelling or delegating housework, etc., might benefit from this new model of remote work. Also people in dual-career, or those whose spouse works under contracts demanding readiness to relocate, now can find a job remotely and therefore continue career and unrestricted self-development.

The idea of becoming “digital nomads” traveling the world while still remaining employed is tempting to Millennials who are particularly concerned about better work-life balance.

Additionally, the model offers notable benefits to companies as “organizations can reduce or eliminate real estate costs, hire and use talent globally” (Choudhury, 2020). WFA can also mitigate immigration issues, e.g., formalities such as obtaining a visa when staff of foreign origin are required. By limiting employment barriers, improving job satisfaction and loyalty, staff retention is

more likely. On top of that, productivity gains are expected to occur. The potential to reverse the brain drain that often plagues emerging markets, small towns, and rural locations can be perceived as added value attributable to the system.

However, one should not ignore the way “WFA affects communication, including brainstorming and problem-solving; knowledge sharing; socialization, camaraderie, and mentoring; performance evaluation and compensation; and data security and regulation“ (Choudhury, 2020). Summing up, organizations where people are collocated, have community feel, which is not available to virtual colleagues.

As WFA can be traced back to the 1970s when the prices of petrol soared, its main benefits consist in enabling reduction of costs involved in commuting. Nevertheless, proliferation of technology, such as computers, the internet, cloud computing, video connections, etc., enabled extensive use of the model.

Sustainable employment demands making the most of the labor potential and enabling people to get employed and stay at work as long as possible. Labor market needs met in a sustainable way also mean that the most disadvantaged groups are educated and trained so that their skills and qualifications follow the altering expectations of employers. This refers in particular to women, older as well as young inexperienced people and those with disabilities, potential workers of migrant background, ethnic minorities who are vulnerable in terms of access to education, services and labor market in general.

An important shift – from manufacturing to services in developed countries, and from agriculture to manufacturing and services in developing countries is naturally reflected in the structure of employment. Service industry development accelerated in the 1960s and demands specific skills to perform intangible tasks rather than manufacture things. The trend has continued so that businesses increasingly depend on human resources which makes talent acquisition and retention particularly important. Labor market participants have to face and adjust to the changing **make-up of jobs** available in the economy.

The most important changes are caused by developing technology and its proliferation which enables productivity growth, but leads to elimination of certain jobs, skills’ imbalance, unemployment and difficulties in finding staff with the right skills. **Digitalization** provides for new forms of work organization (such as platform work, automation of processes) as well as considerable potential in job creation, in particular in innovative, high-productivity business that demands well-educated, highly skilled people (EC, 2019).

New technologies disrupted conventional supply chains and allowed for cutting out middlemen. Furthermore, they contributed to **polarization** of labor market which pictured as an hourglass represents a big number of top positions, knowledge jobs, high-skill, high-wage professionals together with entry-level, low-skill jobs (usually low wage), such as in care, hospitality, etc. Simultaneously, the number of middle (wage) jobs, such as clerical, is shrinking. Technological advances and globalization have created many new jobs for highly educated, highly skilled workers resulting in the talent gap widened and wage inequality between the highest and lowest paid individuals in developed economies. However, in developing economies there are structural barriers, such as limited access to education and opportunities which prevent people from qualifying for high skill, high pay jobs.

This is often a manifestation of the effect of accumulated advantage (**Matthew effect**), which can be summarized by the phrase: “the rich get richer and the poor get poorer”. The advantage can refer to ability, knowledge, status, as well as finances. Scientists in different areas elaborated on the concept described in the Parable of the Talents from the Gospel of Matthew. In education, the effect has been described by psychologist Keith Stanovich who applied it to the skills of reading and observed that early success in acquiring reading skills leads to accrued effects as children grow older while poor performance in learning to read (in the third-fourth year at school) often indicates lifelong problems in learning new skills (Kempe, Eriksson-Gustavsson, & Samuelsson, 2011).

Technology and the trend towards disintermediation (eliminating an intermediary) have led to the development of the idea of crowdsourcing (combination of “crowd” and “outsourcing”) which means getting work or funding, usually online, from a crowd of people. Crowdfunding platforms enable a crowd of people to donate money to projects in exchange for rewards. They are often used by artists and charities, as well as start-ups to raise funds for business development and exclude participation of financial institutions. The best known example is Wikipedia hiring writers and editors, whose work is performed under relaxed employment arrangements.

A rising number of workers employed under non-standard arrangements can be attributed to a range of factors, such as relaxed legislation governing employee contracting and dismissals and the nature of many businesses which demand larger proportion of “flexible” staff. It is often young, migrant, and female workers who meet this criterion. Research showed that in 31 European countries temporary/agency contracts were frequent in hotels and restaurants (21%), education

(15%), health care (15%), wholesale and retail (14%), construction and agricultural sectors.

The European Commission in the Green Paper on Labor Law indicated the need to address the issue of false self-employment and “economically dependent work” (EC, 2006) as according to research 25% of the workforce in the member states worked under non-standard forms of employment. Moreover, between 2007 and 2010, nearly a third of European workers experienced substantial restructuring or reorganization at workplace (Parent-Thirion, Vermeyleen, van Houten, Lyly-Yrjänäinen, Biletta, & Cabrita, 2012).

The economy in which a significant volume of labor is provided by independent contractors rather than by organizational employees benefits organizations which can save large sums of money on labor costs by using workers that are not really their employees.

However, as a consequence of the shift from previously guaranteed permanent employment conditions to mainly worse paid, uncertain jobs, employees struggle facing **precarization** at work. The term has been used since the early 1980s to represent a combination of factors, including lack of certainty over job continuity, poor individual control over work/working hours, low level of protection against unemployment/discrimination, little opportunity for training and career progression. These are linked to the sort of occupation described as “low quality”, “dead-end”, “low pay/low productivity” jobs, according to the EU definition.

Precarious jobs are often concerned with all possible forms of uncertain, not guaranteed, illegal, seasonal/temporary employment, flexible “exploitation”, flex- and temp-work done by subcontractors, freelancers or self-employed.

Temporary employment refers to part-time contracts, pseudo self-employment, on-call contracts, day hire, casual, short-term contracts and multiple jobs taken to make a living. This sort of employment is a “perpetual fixture” in the developed booming economies where labor competition is intense.

There are different dimensions of precariousness, such as organizational, economic, legal and social that differentiate precarious from “standard” work.

Organizational deficiencies result from lack of workers’ individual and collective control over working conditions, working time and shifts, work intensity, health and safety measures.

Poorly or insufficiently paid employees and lack of salary progression contribute to economic/ financial problems. Lack of adequately tailored legal protection

(customary protection against unfair dismissal, discrimination, unacceptable working practices) or social protection (social security benefits covering health, accidents, unemployment insurance) lead to precariousness in social dimension and may result in exclusion (Rodgers & Rodgers, 1989). Although low certainty over continuity of employment is usually paired with temporal employment, it can also accompany staff who work under standard employment but are confronted with organizational change, such as restructuring, downsizing, privatization or outsourcing.

Such processes are undertaken by companies to cushion them from demand shocks, and undercut wage negotiations that enable survival in tough economic conditions.

The forms of precarious employment and discontinued careers may have profound social consequences, such as lack of cohesion and equality; limited capacity to pay rent, obtain bank credit or build a family. Further diminishing birth rates are likely to be another side effect so consequently the situation may perpetuate negative demographic trends.

Researchers notice that impaired access to unemployment benefits and/or pensions and low entitlements connected with employment precariousness will become even more evident and acute when generations of young people, now working under such conditions, reach retirement age. Low income following few hours worked and short job tenure will affect their pension.

Significant changes in the **structure of employment** follow profound social trends. An increase in proportions of women in paid work has been observed since the end of the XXth century. Globally about 70% of women in the 20-54 age group are paid workforce, while in developing countries as a group the percentage is lower at 60% (ILO, 2009). However, as the figures do not capture women's participation in rural and urban informal sectors, they can be undercounted.

Flexible work arrangements, part-time work or home-based work have been typically accepted by female staff who needed them as “secondary” or additional source of family income. The term “pink collar worker” coined in the late 1990s described a member of working class in service industry doing jobs that were typically held by women. Such irregular employment conditions have become widespread in many industries, in particular those based on services.

Thus, the trend of **feminization** of labor strengthened and together with flexibilization contributed to the changing nature of employment. All service jobs, such

as baby sitters, florists, day care workers, nurses, waiters, retail clerks, salespersons and other positions involving relations with people, typically held by woman are now also accepted by men.

Increasing numbers of administrative and support roles, including secretarial, data transcription and clerk-typist jobs, in contemporary labor market are frequently taken on by men, while women have more opportunities in traditionally male white-collar jobs (Eurofound, 2017).

Inclusion of female staff, which is essential for sustainable employment, involves support from the state institutions with respect to childcare, long-term care, and housing. **Childcare** quality and affordability are a pre-condition for parents, in particular mothers, who want to become active job market participants. It can additionally enable or enhance gaining skills by parents, and also reduce inequalities at the start of children's school life. Expenditure per child in most member states increased between 2008 and 2016, but in 2017 it varied by more than 20 hours per week. While in Sweden mothers' employment rate was 82.8% in parallel to high use of childcare services at 52.6%, in Czech Republic the rate was much lower at 45.1% and childcare use only at 6.5%. It should be noted that the use of childcare can be derivative of financial status so that wealthy families can afford even more expensive services in this respect.

High quality and affordable care, as well as work-life balance arrangements (e.g., flexible work and care leave) alleviate the burden on people with caring responsibilities. This way supportive employment and social policies can lead to social sustainability which is affected by demographic ageing, digitalization and globalization.

Work-life balance has been recognized as a factor preventing employees from burnout, keeping them motivated, interested and actively involved. To make it happen there have been pressures on restricting time people spend at work to better their work-life balance. As a result while in 1990 people in OECD countries worked an average of 1,880 hours a year, in 2013, they did it for 1,770 hours. Interestingly, in countries where people work less, overall productivity growth is lower, accompanied by higher productivity rates. This trend suggests that employees and employers alike benefit from working better, not just working longer.

Interestingly, among factors that contribute to sustainability of labor is *affordable and adequate housing* which establishes foundation for formation of skills and provides for social cohesion. It can not only enable access to education and

training, help in entering the labor market, but also support life-long employment, productivity and consequently sustained growth. Affordable housing can facilitate efficient labor allocation, staff mobility and transitions. Research shows the level of affordability differs across EU member states as well as the quality of housing, ownership status and average tenure. Several indicators show positive developments in the EU. According to Eurostat, housing cost overburden rates dropped in most of the EU countries in the first decade of this century.

Housing is meaningful in environmental sustainability from two perspectives – overall energy consumption in the EU (residential buildings are responsible for one quarter) and long commutes to workplace which can create negative environmental spill-over effect.

Learning and training

The demographic and societal changes demand that learning and self-development needs are addressed at different levels. The system is overlooked by the **Bologna Process** and its numerous initiatives and goals, including the Bologna Declaration of 1999 (implemented in 48 states), with particular focus on the European Higher Education Area and Life Long Learning (LLL). This area has been prioritized in the context of socio-economic challenges embracing the issues of innovation, European knowledge societies, changing labor market, aging populations, wider and more active participation, maximization of capacity and talent of all citizens, and empowerment of citizens to be active and responsible.

The main assumption of the process *is* inclusive higher education system with equal access and broad participation in learning. According to the “Renewed EU agenda for higher education” (EC, 2017) the profiles of student populations should mirror the society and its needs. Moreover, the process should be firmly anchored in the new reality and reflect trends of globalization, technological development with respect to new learners and types of learning.

Labor force with up-to-date skill set is key to sustainable development and growth. The potential of **training** can be utilized to improve sustainability provided that different groups are targeted. While childcare and early childhood education support mothers, they also foster skills and equal opportunities in children’s lives. Moreover continued investment in skills, qualifications and formal adult training strengthen employees’ competitiveness and consequently,

higher wage expectations which, if met, contribute to employees' higher standard of living. Through upskilling productivity of lower qualified workers is improved, and their performance in developing business functions becomes viable. Further enhancement of qualifications by taking up studies may result in boosting innovation. Broadened horizons and achievement are likely to contribute to employability which can be additionally boosted by self-awareness and courage to reallocate.

European Working Conditions Survey showed that according to managers apart from good working climate and greater workers' autonomy, regular access to training will favor **productivity** growth through improved motivation, lower incidence of sick leave, greater attraction of skilled workers and higher retention rates (EC, 2019b).

Regular learning opportunities should be provided, on and off the job training sessions, management development programs and distance learning programs should be conducted for employees.

Investment in human capital development and high-quality innovative capital can enhance total factor productivity growth by more efficient use of productive factors rather than expanding their use. Its spin-off effect is competitive advantage which can guarantee inflow of better educated staff, and higher productivity pay which further stimulates their efficiency. However, an increase in work responsibilities and pressure can lower one's productivity.

It is argued the EU facing scarcity of natural resources and changes within the structure of human capital should ensure that future growth is founded on more efficient use of the resources available.

The measure of efficiency in the use of resources is Total Factor Productivity (TFP) which indicates which part of economic growth is due to higher efficiency in production rather than increase in factor input. Therefore it is a reflection of the level of sustainability of growth. Research showed that Total Factor Productivity growth in the EU was lower than in other major economies: in 1995-2020 in the EU its increase was estimated at 19%, while in the USA it stood at 24%. Within member states as well as sectors and companies of different sizes considerable differences were noted. (EC, 2019a).

The core element that can improve total factor productivity and efficiency is human capital, its education and skills which drive an ability to innovate. There are technologically advanced regions within the EU that provide for "technological benchmark". The capacity of the economy to implement new technologies

depends on the skills of its workforce and its level of education. It is also derivative of R&D expenditure and support of government institutions which boost trust of citizens and companies (EC, 2019a).

Labor market policies and strategies for sustainability should be targeted at stimulating growth of green(ing) sectors. Such strategies might lead to job creation in the areas in industry and services, construction, waste management and sustainable finance.

Among the **EU objectives towards sustainable development** its social dimension is given a priority. This involves social dialogue and social justice, elimination of exclusion and discrimination, gender equality, improvement and harmonization of living and working standards, good working conditions and well-being, promotion of employment, human capital development.

In particular initiatives to promote workers' sustainable employment and extend the labor participation of older workers are necessary (Billett, Dymock, Johnson, & Martin, 2011).

Improving workers' employability through social investment and training is one of the core objectives of the European Social Fund, and the European Commission proposed to support it with EUR 101.2 billion in the period of 2021-2027. This investment is expected to benefit receiving countries, in particular in less developed regions (that is with GDP per inhabitant less than 75% of the EU average), by increasing productivity by 0.7% and GDP by 1% in the long term (as compared with no investment scenario).

It is argued that economic growth has to rely increasingly on productivity gains and their wider distribution to provide for financial sustainability of the welfare state (EC, 2019). While favorable social conditions improve efficiency of the welfare state in lowering poverty rates and inequality, they demand higher government revenue which may be obtained from taxes. On the other hand, high labor costs and taxes limit growth potential.

Elements of sustainable development overlap and link different dimensions by contributing to a **virtuous/vicious circle/cycle** of sustainable development and reinforcing each other. By promoting productivity and efficiency through policies on human capital (skills and social welfare in general) and (government) institutions, labor market efficiency is boosted. This is a precondition to sustainable development as structural weaknesses in product and labor market undermine sustainability, and hence competitiveness, wage increases, employment prospects. Thus, labor market efficiency can generate favorable social outcomes,

however, “regulatory barriers, high (labor) taxes and efficient social expenditure represent limits to growth” (EC, 2019).

Research shows that there are disparities across the EU: while in the South of Europe relatively high unemployment, poor labor market performance of vulnerable groups and low bargaining power of employees are typical, the North-Western member states have solid sustainable development foundations. They are created by supportive institutions as well as by investment in skills to boost productivity and investment in social welfare. Additionally, they display higher efficiency in use of natural resources. Moreover, the eastern member states lag behind because of lack of well established “tradition in social dialogue”, low trust in institutions, and less advanced implementation of skills and environmental policies.

These considerations lead to clear distinction of factors with potential to **support sustainability**: investment in people to enhance their skills and qualifications, but also its social component to improve well-being, mitigate social risks by enabling workers to acquire new skills, remain active in labor market in life course transitions. Such measures should strengthen labor force’s innovation potential.

According to van Dam, van Vuuren, & Kemps (2017) intrinsically motivating job (intrinsic job value) and age supportive climate are indispensable to guarantee sustainable employment. The authors conclude that indicators of employees’ sustainable employment are as follows: affective commitment, work engagement and employability.

Investment in education can produce many spill-over effects including higher qualifications, higher employment rates, higher wages and better health conditions. Numerous benefits for societies involve tax revenues and social security contributions which translate into lower social expenditure. More active citizens are committed to participating in the labor market even at the expense of facing intense competition. This is associated with readiness to constantly acquire new skills and continue education through LLL which is particularly valued by companies that have to go through transitions. According to research the likelihood of having a job is 45% greater for people with tertiary education. Because of this, governments in most of the EU member states maintain stable level of expenditure on education per student, however in Ireland, Greece, the UK a downward trend has been observed. The reasoning behind decisions leading to such trends might be based on the assurance that public spending on education will confer benefits on families that already have a good level of education

rather than on those that do not, if “Matthew effect” (discussed earlier) is at play (EC, 2019). This may also be inferred by observing the results of research which prove that adult **education** should be rather driven by non-formal training providing for flexibility and lower costs. Additionally, if training is commissioned and funded by employers, transferability of the new skills acquired is limited.

Interestingly, students’ education was found to be more effective if accompanied by work experience during studies, which increases likelihood of employment by 9% (EC, 2019).

While the share of persons with tertiary education increases, the need to further strengthen lifelong learning capacities follows.

The rising number of individuals beyond the traditional age of retirement relative to the number of individuals of working age stipulates incentives for longer working lives should be implemented. This can be supported by increase in participation of adults in lifelong learning (LLL). According to the EU statistics, the participation of the working population (aged 25-64) in education and training (last 4 weeks) in 2020 was rather low at 9.2%. There were significant differences observed between the population of the European countries where the involvement in LLL ranged from 28.6% in Sweden to 1.0% in Romania. In certain countries – Bulgaria, Greece, Croatia, Poland, Slovakia – the rate below 5% should be considered as very low (Eurostat, 2021).

Similarly, the data illustrating participation rate in education and training from across Europe (in last 12 months in 2016) show significant differences ranging from 70% participation in the leading Swiss population, with Norway, the Netherlands and Sweden following close behind at over 60%, to less than 10% participation in Romania. (EC, 2021).

According to N. Dempsey, Minister for Education and Science, Ireland, and Chair of the 2004 Meeting of OECD Education Ministers, education should be seen as a main factor strengthening competitiveness, employment and social cohesion in the global knowledge economy, creating opportunities for knowledge workers and other workers as members of the society. “In addition to technological skills, competences in creativity, tolerance, appreciation of diversity and social skills form an important part of any high quality education system” (OECD Observer, 2004).

Knowledge and intellectual capital in contemporary business

Knowledge based economy, the paradigm of the 21st century, has been gaining pace since the last decade of the XXth century (OECD, 1996). The term implies that innovation, high-tech sectors and services play a prominent part in the structure of employment, GDP and economic growth.

According to Drucker (1999), knowledge-based economy is both created and applied in business processes, so as the variety and multitude of applications of knowledge can lead and contribute to economic growth. Exploitation of knowledge in new, modified ways in business processes enables constant product and service development and improvement (*kaizen*). Knowledge based economy requires ceaseless investment in the development of knowledge capital which consists of cumulated scientific knowledge (R&D) and the level of knowledge of the society (level of education).

Knowledge is an attribute of human capital whose formation starts in a family, and is later enriched by schooling system and social environment to be incorporated in a mature individual ready to undertake roles in the economy (Galar, 2003). It is the only resource which can accrue in the process of gaining experience. As the resource possessed and controlled entirely by individuals it can be developed by them, while being supported by employers and managers creating favorable conditions for this development.

In contemporary economies intellectual capital requires skillful management in business practice. Apart from identifying a person's natural skills, talent, personality and traits, offering a job that makes the most of one's potential, conditions should be created to enable advancement. An integrated set of activities and functions should ensure the organization attracts, retains, motivates and develops the talented people it needs now and in the future.

According to Lundwall & Johnson (1994), the aspects of knowledge are facts, reasons, ways of conduct, people with knowledge and skills, referred to as: Know – What, Know – Why, Know – How and Know – Who. Therefore, knowledge based economy in a broad meaning includes, apart from enterprises driven by the need to gain competitive advantage, individuals/natural persons, schools, social organizations and the state.

Talent management also known as Human Capital Management (HCM) has gained a role of strategic importance. While the war for talent” is not new, it has

taken a new dimension in the Global Village Era. Attracting highly skilled workers, integrating new staff, developing and retaining workers is important to meet current and future business objectives and ensure sustainability. Learning opportunities on and off the job, training sessions, management development programs, distance learning programs should be parallel to provision of “time to de-stress”, entertainment, and fun activities to leave employees refreshed.

Sound talent management can prevent people from changing jobs for such reasons as unhealthy working atmosphere, better opportunities or compensation package elsewhere.

All gaps between the organizational and personal goals should be narrowed down and good practices, such as promises kept, merit recognized, motivation, rewards and appreciation cultivated.

While everyone in an organization possesses certain talents, only a few people demonstrate a remarkable degree of talent so management processes should not be only concerned with the key people – high flyers – employees who stand out, excel in their current roles, have skills and knowledge necessary to thrive in managerial positions and senior roles.). While high **potential** employees can have a disproportionate impact on business’ performance, lack of care in recruitment and further management of the pool of other talents can lead to an employee stuck in the wrong job followed by new hires and attrition resulting in diminished loyalty, bad atmosphere and even loss of business. Therefore talent management should aim at improving the calibre, availability and flexible utilization of all employees. This involves attracting talents towards the organization, appointing, identifying aspiration, ability, engagement, developing talent pool through re-training, managing competitive salaries/professional fees, and performance evaluation. Retention management techniques should be applied through right placement, training and development, growth planning, performance management and rewards to encourage high-fliers and prevent demotivation.

Self-motivation and sense of ambition are often employees’ advancement driving forces, rather than promotion or remuneration. However, feedback and criticism taken positively, as well as failure treated as a learning opportunity, and positivity boosted contribute to success.

Emotional intelligence involves ability to adapt and adjust to change, embrace it, understand and accept that it is the only constant in life. Tied to empathy, it is critical to success as favoring stronger relationships, mutual respect, trust, and openness. Empathy, in particular, enables employees to operate better as a team, connect with colleagues on an emotional level, and genuinely work together.

Role development in organizations, career progression make extended use of talents possible. It should be supported by encouragement and reasonable degree of security. Responsibility, flexibility and autonomy are required to create engagement and motivation. Treating individual employees fairly, recognizing their **value**, giving them a **voice** and providing opportunities for growth can lead to **commitment** to work/organization, talent **engagement**, and skills' enhancement. Competencies should be formulated by reference to "employee success profiles" (competencies and qualities that need to be developed) after competency gap between required and available competencies is established. Self-awareness of strengths and weaknesses, open-mindedness, creativity, resourcefulness and flexibility seem to be fundamental in sustainable employment.

Recognition of merit, timely motivation, rewards and appreciation will keep the employees' spirit alive and may encourage them to perform better. Concerted action is required to retain talented people, to encourage commitment and contribution from existing talent. Particularly gifted and talented people should have the sequence of **experience** supplemented by **coaching** and learning programs that will fit them to carry out more demanding **roles** in the **future**. The organization's overall culture and work climate improved may lead to retention of talent, and turnover decreased.

The turnover of key employees can have a disproportionate impact on the business. The people organizations wish to retain are often the ones most likely to leave. Reed (2001) claims that: "Every worker is five minutes away from handing in his or her notice, and 150 working hours away from walking out of the door to a better offer. There is no such thing as a 'job for life' and today's workers have few qualms about leaving employers for "greener pastures". The average permanent job in the UK lasts six years.

According to Hall (1984), each individual follows a **career life cycle**. On joining the organization career planning should take place followed by focus on progress within particular areas of work, where skills and potential are developed through experience, training, coaching, mentoring and performance management. Career planning can be supported by processes of succession planning, performance and potential assessment as well as talent audits.

All stages in one's career need specific measures. In mid-career stage, some people will still have good career prospects while others may have got to where they wanted. It is necessary to ensure that these "plateaued" people do not lose interest at this stage by taking such steps as providing them with cross-functional moves, job rotation, special assignments, recognition and rewards for effective

performance. In the later career stage, individuals may have settled down at certain level they have reached, but are beginning to be concerned about the future. They need to be treated with respect as people who are still making contribution and be given opportunities to take on new challenges and reassured about their future with the organization. At the end of career, there is possibility of phasing disengagement by being given the chance to work part-time before they finally go.

From the perspective of contemporary challenges Knowledge Management focus needs to be on **retaining the knowledge of retirees**. One of the techniques might be application of the lessons learned idea, treating the retiree's career as a long project coming to an end.

In case a current employee has a knowledge need, he or she can look for the information in the data provided. Also staff can be briefed on the issues that could possibly arise. Retirees can be involved in the discussions concerning current issues, and findable through expertize locator systems. The real utility is likely to be found not directly in the information that the retiree leaves behind, but in new knowledge created by the interaction of the retiree with current employees. The discussion can result in solution being derivative of the retiree's knowledge and expertize as well as interaction with current staff because "tacit knowledge" as opposed to explicit and implicit knowledge only resides in someone's head and can surface by interaction.

KEY TERMS

Demographic changes, generations, employability, sustainable employment, talent, skills, education, LLL.

SUBCHAPTER SUMMARY

Exponential pace of changes in the XXI century, in particular affects technology and demands labor force skills are adjusted accordingly. Responding to the changes already happening by adapting to them activates individuals and furthers even more profound changes.

Highly skilled employees are demanded by companies to utilize new technologies to develop, advance and compete and to be able to compete internationally and follow the global trends.

Changing demands of the labor market result from disappearing jobs and surplus skills while other skills useful for new emerging jobs are scarce. Under such conditions employment demands openness and readiness to acquire and polish new skills.

Upgraded skills are necessary not only to actively participate in the job market but also to be independent and efficient in daily activities, IT literacy skills are increasingly needed in everyday life to guarantee autonomy, efficiency and inclusion. Thus, individuals have been increasingly affected by demands of the information age. The increasing level of educational attainment of the population in OECD countries is both the cause and consequence of the changes

DISCUSSION QUESTIONS

1. What barriers are there to sustainable employment in different countries?
2. Draw a chart illustrating vicious circle of sustainable development and describe the influences. Which factors do you perceive as core?
3. What management challenges have to be faced in today's business?

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2.3.5. Changing the social behavior of institutional and retail investors

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LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- define institutional investors and identify the characteristics that make institutional investors key elements in the development of efficient financial systems;
- identify which characteristics make institutional investors natural candidates for ESG investments;
- analyze the attitude of retail investors towards sustainable investments;
- understand the drivers that can foster sustainable investment for the institutional and retail investors;
- describe the characteristics of sustainable and responsible mutual funds;
- distinguish the main approaches for integrating ESG factors into the analysis of financial assets;
- discuss the content and the effects of the sustainable finance regulation.

Institutional investors – defining aspects

This Subchapter discusses institutional investors and their attitude toward sustainable investments. However, before addressing the topic, it is useful to look at some definitions. What do we mean by “institutional investor”? What is the function of institutional investors in the financial system? Who are the institutional investors in the European financial system? What are the special characteristics of an institutional investor?

There is consensus in the literature that institutional investors are all those specialized financial institutions that manage savings on behalf of individual investors intending to achieve a specific objective in terms of an acceptable level of risk, maximization of expected return, and maturity of assets held (Davis & Steil, 2001).

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Institutional investors are a key component of modern financial systems. Just think that in all major countries, the largest share of financial wealth and savings is managed by institutional investors and that they are responsible for asset management within the financial system. Asset management refers to financial intermediation activities aimed at managing savings on behalf of third parties, and in particular at optimising the combination of risk and return. The class of institutional investors includes various categories of operators, which vary widely in terms of form and economic characteristics of production processes.

From a legislative perspective, there is still no clear regulatory definition of an institutional investor. Legislation, even European legislation, does not provide a single, clear definition of an institutional investor. MIFID – Markets in Financial Instruments Directive (Directive 2014/65/EU), for example, classifies institutional investors as a subset of “professional investors”, and defines a professional client as “a client who possesses the experience, knowledge, and expertise to make its own investment decisions and properly assess the risks that it incurs” (Directive 2014/65/EU, Annex II).

In other words, the European legislator provides an “open” definition of institutional investors. In addition to the explicit reference to mutual funds, insurance companies, pension funds, etc., there is also the category “Other institutional investors” whose key activity is “to invest in financial instruments, including entities dedicated to the securitisation of assets or other financing transactions” (Directive 2014/65/EU)⁶. The definition is thus open to a great extent.

⁶ MIFID reads: “the following shall all be regarded as professionals in all investment services and activities and financial instruments for the Directive. (1) Entities that are required to be authorised or regulated to operate in the financial markets. The list below shall be understood as including all authorised entities carrying out the characteristic activities of the entities mentioned: entities authorised by a Member State under a Directive, entities authorised or regulated by a Member State without reference to a Directive, and entities authorised or regulated by a third country: (a) Credit institutions; (b) Investment firms; (c) Other authorised or regulated financial institutions; (d) Insurance companies; (e) Collective investment schemes and management companies of such schemes; (f) Pension funds and management companies of such funds; (g) Commodity and commodity derivatives dealers; (h) Locals; (i) Other institutional investors. (2) Large undertakings meeting two of the following size requirements on a company basis: – balance sheet total: EUR 20 000 000 – net turnover: EUR 40 000 000 – own funds: EUR 2 000 000. (3) National and regional governments, including public bodies that manage public debt at national or regional level, Central Banks, international and supranational institutions such as the World Bank, the IMF, the ECB, the EIB, and other similar international organisations. (4) Other institutional investors whose main activity is to invest in financial instruments, including entities dedicated to the securitisation of assets or other financing transactions” (Directive (Directive 2014/65/EU).

In any case, the lowest common denominator among all categories of institutional investors is the “professional practice of asset management on behalf of several individuals” (Basile, Braga, & Ferrari, 2019). And following this principle, we consider institutional investors to be primarily:

- mutual funds,
- portfolio management,
- insurance companies,
- pension funds and other social security institutions⁷,
- banking foundations⁸.

The nature of the business conducted by each category of institutional investors varies widely. The following Table 2.11 summarizes the distinctive features of the various institutional investors.

Table 2.11. Distinctive features of institutional investors

Institutional investor	Key features
Mutual funds	Mutual funds fall into the category of Undertakings for Collective Investment in Transferable Securities (UCITS). They are investment vehicles whose function is to pool the financial resources of many savers into a single undifferentiated heritage that is invested in financial assets
Portfolio management	Portfolio management can be defined as investment services in which the investor’s assets are managed on a discretionary and individual basis. The assets are allocated to one or more financial instruments according to the mandate the investor gives to financial intermediaries.
Insurance companies	Insurance companies are companies that institutionally and systematically bear and manage pure risks delegated to them by companies and individuals. In return for the premium received from policyholders, insurance companies undertake to pay compensation, capital, and annuities
Pension funds and other social security institutions	Pension funds are supplementary pension instruments. They collect contributions from employees and/or employers and invest them in financial instruments, to provide a pension benefit (life annuity or capital) at the end of the employee’s working life
Banking foundations	Banking foundations are a non-profit, private, autonomous legal entity, which pursues exclusively aims of social utility and promotion of the economic development of society

Source: Authors’ own elaboration.

⁷ For example, in the case of Italy, social insurance funds (*casse di previdenza private*) are included in the definition of institutional investors.

⁸ Assuming a broader definition of an institutional investor, it is possible to include banks because of the need to manage the proprietary securities portfolio (Basile et al., 2019).

The essential economic characteristics of institutional investors are as follows (Onado, 2016): (1) the institutional investor generically has a performance obligation towards the saver; (2) there is a fiduciary relationship between saver and investor, which commits the institutional investor to act in the exclusive interest of the saver; (3) institutional investors specialize in the construction of financial portfolios, i.e., in the process of evaluating and selecting securities, intending to exploit the financial advantages of diversification; (4) in most cases, there is an explicit mandate to manage portfolios; (5) portfolio management can be carried out collectively or individually, or through an intermediary such as an insurance company.

In this subchapter, we will focus on the three most important categories of institutional investors, mutual funds, insurance companies, and pension funds. They are described below.

Mutual funds are the broadest and most heterogeneous category, and can vary widely according to national legislation frameworks (Mishkin & Eakins, 2018; Saunders & Cornett, 2019). Mutual funds are investment instruments, run by asset management companies. They pool the resources of several savers and invest them, as a single asset, in financial assets (shares, bonds, government securities, etc.) or sometimes real estate assets. They are divided into many unitary parts, called units, which are subscribed by savers and guarantee equal rights. Investing in mutual funds generates a number of advantages for the final investor, especially resulting from the professional management of assets by professionals using their knowledge and experience. Such collective management makes it possible to contain transaction costs and to create highly diversified portfolios with undoubted benefits in terms of risk sustainability. Among the benefits, however, there is no guarantee of a return or capital. The value of the assets that make up the funds may vary in connection with the performance of the relevant markets.

As we saw, insurance companies are intermediaries that institutionally and systematically bear and manage pure risks delegated to them by firms and individuals. There are two types of insurance companies. The distinction stems from the usual division of the insurance business into two branches: life insurance and fire and casualty insurance. Life insurance companies insure people against financial losses caused by death or other life events. When such events occur, the company undertakes to pay capital or annuities. Fire and casualty insurance companies insure against loss resulting from theft, fire, and accidents. In this second case, the company undertakes to pay compensation for damage. Gener-

ally, an insurance company, thanks to the large number of risks insured and the fact that it operates on a technical basis, can predict the probability of certain risks occurring and spread the negative consequences among several insured parties exposed to the same type of risk. The insurance company collects the premium from customers in advance and invests it in the markets to obtain the resources needed to meet its commitments. It is clear that, although there are differences between business lines (life and non-life), we are dealing with broad investment activity.

Pension funds provide retirement income to employees who have a pension plan. The funds are acquired from employer and/or employee contributions voluntarily. These contributions are invested collectively in the financial and real estate markets to provide a pension benefit (preferably an annuity) at the end of the employee's working life. Pension fund assets are highly diversified with several investment lines that the contributor can join. In many Western countries, the establishment of pension funds has been actively encouraged by governments through legislation introducing pension plans and tax incentives.

Note also that the categories of institutional investors differ in the characteristics of regulation and supervision. In general, thanks to the dimensions of the financial wealth that institutional investors manage, they exercise a key economic function and are accordingly subject to specific regulation to protect savers. In terms of regulation, national legislation takes a central role. From country to country, there may also be big differences in the regulation of various investors. These regulatory differences are reflected in the characteristics of intermediaries. In terms of supervision, the different categories of institutional investors are supervised by various national authorities, according to specific supervisory models. Various levels of supervision also exist at the European level. As an example, ESMA monitors mutual funds, while EIOPA monitors insurance companies and pension funds.

It is also clear that mutual funds, insurance companies, and pension funds differ in the nature of their business and consequently in management strategies, which have similarities and differences. Table 2.12 compares institutional investors' management strategies in terms of objectives, risk attitude, time horizon, financial profile, and management type.

Table 2.12. Features of investment strategies by type of institutional investor

Institutional investor	Objectives	Risk attitude	Time horizon	Financial profile	Management type
Mutual funds	Maximization of return (relative to the benchmark)	Variable, depending on the type of fund	Variable time horizon	Net daily unexpected liquidity flows	Asset-only
Insurance companies	Investments of premiums, collected in advance, to generate a result at least equal to the financial return predicted by terms of tariffs and technical provisions	Medium-low	Variable time horizon depending on the line of business and type of policy (life or non-life)	Expected liquidity needs	Asset-liability management
Pension funds	Guarantee members a predefined benefit (defined benefit funds) or maximize performance for a given level of risk (defined contribution funds)	Variable, depending on the type of fund	Long-term	Expected liquidity needs by working age of members	Asset-liability management (defined benefit funds) or asset-only (defined contribution funds)

Source: Based on: Basile et al. (2019).

In general, the objective of an institutional investor's investment policy is to achieve efficient risk-return combinations over an appropriate time horizon, taking into account any performance commitments or guarantees provided to final investors.

In the case of mutual funds, the frequent absence of a predefined time horizon makes the setting of absolute return targets problematic, and the comparison with market parameters, on the one hand, and with competitors on the other, inevitable. The result is the widespread adoption of relative risk measures and ex-post management assessment based on risk-adjusted performance indicators. From a financial point of view, the absence of exit barriers imposes the need to maintain liquidity reserves and precludes any form of medium-term financial planning. The situation is different for life insurance companies and pension funds, from both an economic and financial point of view. In fact, they build their investment policy based on the commitments they have undertaken, in quantitative and temporal terms, in a deterministic manner or one that can be estimated with sufficient precision on a statistical/actuarial basis vis-à-vis their delegators. Life insurance companies and pension funds benefit from greater programmability of cash flows and a reference horizon for their medium and

long-term allocation choices. We discuss briefly below how this makes companies and pension funds candidates for the possible integration of ESG factors in their investment policies, at least on paper.

In the absence of specific obligations, the allocation policies are similar to those of delegated management, while in the hypothesis of precise commitments in terms of guaranteeing capital or its remuneration, reference to asset-liability management techniques is natural. In this respect, there are two types of management: (1) asset-only management policies – in this case, the institutional investor has no predefined performance commitments and can adopt an investment policy based only on optimal asset allocation; the investor must, however, pay attention to the liquidity that the management model imposes; (2) asset-liability management policies – in this second case, the institutional investor must carry out an investment policy compatible with the commitments made to the final investors. It is very important to constantly monitor the accumulated capital of the end investors and the present value of liabilities and commitments at a certain date.

There is a final point to consider. In general, economic theory has demonstrated the existence of a virtuous circle between economic growth, stock market development, and the strength of the institutional investor fabric. When institutional investors reach a significant weight concerning intermediation volumes, the financial system receives positive impulses in terms of competitive structure and efficiency.

In fact, institutional investors can have a positive impact on: (1) structure of financial systems, (2) strategies of financial intermediaries, (3) market organization, (4) market efficiency, (5) governance and performance of investee companies, (6) regulation and control of financial activity, (6) asset management industry (Basile et al., 2019).

The link between “economic growth, stock market development” and “institutional investors” has become even closer in recent decades. The first reason is that financing through the markets has grown faster than bank financing. The second reason is that a growing share of supplementary pensions is being directed towards the market in all countries, usually in the attempt to replace public pensions, which are becoming less and less robust as the population ages (Onado, 2016). Many exogenous socio-political variables contribute to accelerating the virtuous relationship between investors and the growth of the financial system. For example, the demographic changes taking place worldwide (irreversible ageing of the population) have called into question the sustainability of

existing social security systems. The effect is an overall reorganization of the financial choices typical of the different stages of the household life cycle. In particular, the age group characterized by higher savings rates and more pronounced pension needs is increasing (Basile et al., 2019).

The economics literature confirms that there is also a link between market size and economic development (Onado, 2016). It finds that institutional investors play a key role in the development of financial markets for three reasons: (1) they offer the public access to diversified portfolios, which are therefore more efficient than those available to individual investors; (2) they play an essential role in assessing the risk of individual securities; (3) as holders of shares – they can exercise voting rights and contribute to the efficiency of management and in particular to maximizing the value of companies.

These characteristics are particularly relevant with regard to sustainability issues, which are discussed in the following section.

The attitude of institutional investors towards sustainable investments

In this section, we look at the relationship between institutional investors and sustainability, focusing on the attitude of institutional investors towards responsible and sustainable investments.

In the recent past, sustainability and responsible finance have played a crucial role. According to Eurosif (2018), “Sustainable and Responsible Investments (SRI) is a long-term oriented investment approach, which integrates environmental, social and governance (ESG) factors in the research, analysis and selection process of securities within an investment portfolio. It combines fundamental analysis and engagement with an evaluation of ESG factors to better capture long term returns for investors and to benefit society by influencing the behavior of companies”.

Environmental, social, and governance (ESG)⁹ issues have never been at the heart of institutional investors’ investment strategies. However, due to several

⁹ Environmental (E) – issues relating to the quality and functioning of the natural environment and natural systems. These include: biodiversity loss; greenhouse gas (GHG) emissions, climate change, renewable energy, energy efficiency, air, water or resource depletion or pollution, waste management, stratospheric ozone depletion, changes in land use, ocean acidification and changes to the nitrogen and phosphorus cycles. Social (S) – issues relating to the rights, well-being

factors considered below, institutional investors have been forced to consider the environmental and social implications of their portfolios. Today, increasing numbers of institutional investors recognize environmental, social, and governance factors as drivers of value.

Several recent surveys at European and at the global level seem to confirm this trend. The increase of assets under management that incorporates the ESG element has grown enormously over the past decade. In the US, the current level of ESG investing is now over 20% of all professionally managed assets, at over USD 11 trillion (US SIF, 2018). In Europe, industry data related to a broader range of ESG practices suggests the level is over USD 17 trillion. ESG investment fund and ETF have grown to over USD 1 trillion in the US, and less so in Europe. The reason driving the growth is the institutional and final investors' desire for pooled investments and liquidity. Also, the increasing development of ESG instruments, such as ESG funds, has overtaken USD 1 trillion in assets under management (Boffo & Patalano, 2020).

The latest Mercer survey (2020)¹⁰ reports that the vast majority of participants (89%) consider ESG risks in their investment decisions. This statistic is growing rapidly: it is up from 55% in 2019 and 40% in 2018. The Mercer survey also states that the main drivers of increased attention to sustainability issues are regulatory compliance (85%) and the search for better performance, both in terms of returns (51%) and reputation (40%). Furthermore, across Europe, institutional investors' awareness of climate change investment risk is increasing (+40%), with the percentage of the sample taking this into account globally jumping from 14% in 2019 to 54% today.

and interests of people and communities. These include: human rights, labor standards in the supply chain, child, slave and bonded labor, workplace health and safety, freedom of association and freedom of expression, human capital management and employee relations; diversity; relations with local communities, activities in conflict zones, health and access to medicine, HIV/AIDS, consumer protection; and controversial weapons. Governance (G) – issues relating to the governance of companies and other investee entities. In the listed equity context these include: board structure, size, diversity, skills and independence, executive pay, shareholder rights, stakeholder interaction, disclosure of information, business ethics, bribery and corruption, internal controls and risk management, and, in general, issues dealing with the relationship between a company's management, its board, its shareholders and its other stakeholders. This category may also include matters of business strategy, encompassing both the implications of business strategy for environmental and social issues, and how the strategy is to be implemented. In the unlisted asset classes, governance issues also include matters of fund governance, such as the powers of Advisory Committees, valuation issues, fee structures, etc. (PRI, 2015).

¹⁰ The survey covers 12 European countries and more than 900 institutional portfolios with total assets of more than EUR 1100 billion.

There are heterogeneous views as to how ESG integration fits with institutional investors' duties. To adapt institutional investors' governance processes to ESG integration, some important considerations can be included, in particular: (1) changing views of what qualifies prudent investment, (2) fiduciary responsibilities and savers' interests; (3) evidence of the financial effects of ESG-related risks and opportunities; (4) assessment of climate change portfolio risk; (5) technical capabilities and competing priorities (OECD, 2017).

According to the OECD, the decision of whether or not to integrate ESG factors into the governance of institutional investors will be based on how much they think sustainability has a real impact on their ability to meet their liabilities (now and in the future perspective). The OECD (2017) identifies four types of institutional investors, according to their investment policy focus and how they integrate ESG factors into their investment portfolio decisions. The Table 2.13 shows this classification.

Table 2.13. Different types of ESG integration

Type of investor	Key features
Traditional investors	They think that ESG factors are not important or even detrimental to financial performance. They will decide not to integrate ESG factors. Their belief/behavior is in line with Modern Portfolio Theory (MPT) – they believe that all ESG risks and opportunities are already priced into any potential investment
Modern investors	They believe that price inefficiencies exist, and they also believe that ESG integration can improve their analytical capabilities. They will decide to integrate ESG factors to the extent that they have an influence on company financial valuations and consequently on portfolio performance
Broader goal investors	They think that ESG criteria are important to portfolio return, but also believe that their duties to their clients include consideration of their long-term financial and nonfinancial well-being. They will decide to integrate ESG indicators, accepting some financial sacrifice (e.g., excluding arms and/or tobacco stocks)
Universal investors	They believe that ESG factors are future systemic risk factors and believe that they have a responsibility as investors to support general economic health. They will therefore decide to fully integrate ESG factors into their investment governance. They will align their portfolios with ESG objectives, even if they do not consider them to be nonfinancial objectives (as “Broader goal investors”). For them, ESG factors affect both macroeconomic performance and financial health. For this type of investor, environmental issues are very relevant. In this sense, universal investors will seek to make investments that have a positive environmental effect

Source: Based on: OECD (2017, pp. 25-26).

Looking at the proposed classification, we find that at its extremes are the “traditional investors” and the “universal investors” Traditional investors are convinced that their obligations to retail investors are exclusively financial and that ESG integration would not increase their ability to respond to these obligations. Conversely, universal investors believe that their continued ability to pay financial benefits is intrinsically linked to ESG issues.

Once the institutional investor decides to integrate ESG indicators, the range of different measures includes: (1) integrating ESG factors in portfolio analysis, (2) setting out a statement of ESG principles, (3) attempts to automate ESG signals in trading and risk platforms, (4) taking a liability-driven approach to ESG factors. The size and resources of the institutional investor tend to have a big influence on the approach taken, but the primary driver is concern about ESG risks (OECD, 2017).

There are several different investment strategies through which institutional investors take account of ESG factors in their portfolio construction. The Reporting Framework PRI 2020 (PRI, 2019) lists four ways in which ESG information can be reviewed and used in the investment decision-making process:

- screening,
- sustainability themed investment (also referred to as environmentally and socially themed investment),
- integration of ESG issues,
- a combination of the above.

These strategies are widely discussed in the relevant literature and presented in detail later in this Subchapter.

Having described the prototypes of institutional investors and how they may consider sustainable investing, we ask: what is driving the change? Over the last years, investors have become increasingly interested in ESG issues. Eccles and Klimenko (2019) identify six factors that are acting as drivers for this increased attention.

The size of investment firms is the first factor for the change. It should be noted that the asset management industry is highly concentrated and there are large institutional investors with high assets under management. Because of this characteristic, investors must necessarily contribute to the sustainability of the global economy. In other words, their large size justifies a kind of activism on environmental and social issues. Moreover, Eccles and Klimenko (2019) remind us

that large institutional investors such as pension funds are obliged to take a long-term view because they have long-term liabilities (for example, they are required to plan to pay out retirement pensions for the next 100 years).

The second driver identified by Eccles and Klimenko is financial return, which is closely linked to the third driver, materiality. Today, there is a consensus in the international literature that ESG factors influence investment financial profit through their effects on corporate financial performance and through the risks they pose to economic growth and financial market stability (OECD, 2017). However, many managers still equate sustainable investing with its predecessor, socially responsible investing (SRI), and believe that investing sustainably involves sacrifice in terms of financial return. Many studies show how this view can be overcome. For example, a study by Eccles and Serafeim (2013) showed that companies that developed appropriate procedures to measure, manage and communicate performance on ESG issues in the early 1990s achieved higher returns over the following 18 years than a control group.

Moreover, materiality matters, and sustainable investing is about materiality¹¹. The literature shows that companies that focus on material issues tend to outperform those that do not. For example, a study by Khan, Serafeim, and Yoon (2017) shows that good performance on material issues contributes to higher financial returns.

The next driver leading to change is growing demand. Asset owners are increasingly demanding sustainable investing strategies from their asset managers. In other words, growing demand is driven by asset owners interested in nonfinancial returns. The main observation of recent surveys by private sector participants is that interests in the use of ESG range widely across social and financial considerations: institutional investors clearly focus on the benefits of ESG investing for financial returns and risk management, while end-investors focus more on the alignment of portfolios with societal values (Boffo & Patalano 2020). In other terms, the savers want their investments to make a difference and make a better world.

Another driver may be an evolution of the fiduciary mandate or duty. PRI (2015) finds that many asset owners consider fiduciary duty as an obstacle to ESG integration. Eccles and Klimenko (2019) argue that the misconception that “sustainable investing” means sacrificing part of the financial return results in a further

¹¹ Obviously, materiality varies by sector. The Sustainability Accounting Standards Board (SASB) has identified material ESG issues for all 77 sectors in its classification system ([sasb.org](https://www.sasb.org)).

misconception, namely that fiduciary duty means focusing only on returns. However, legal opinions and especially recently issued regulatory guidelines make it clear that the opposite is true, i.e. not considering ESG factors can be a breach of fiduciary duty¹².

For most institutional investors, the discussion on the interpretation of fiduciary duty is important. It addresses the central question of how institutional investors understand their responsibilities to clients and how this impacts the integration of ESG factors. Note that there is no single definition of the principle of fiduciary duty. Indeed, the definition and application of fiduciary standards vary in different legislative systems and geographic-cultural contexts.

Trickle-down within investment firms plays a fundamental role, according to Eccles and Klimenko (2019). The CEO or chief investment officer must support ESG investment, but it is even more necessary for it to be supported by analysts and portfolio managers. Integration towards ESG investment has to be accepted and carried out mainly by middle-level management, i.e., the people who make the investment decisions daily.

Finally, one of the main elements driving the transition to sustainable investment is increased investor activism. Engagement is a key aspect.

There is a consensus in the literature that institutional investors exert significant influence on the governance model as well as corporate strategies and policies (OECD, 2017). Institutional investor engagement has an impact on companies at various levels, including (1) the overall relationship between shareholders and management; (2) management remuneration and incentive models; (3) degree of disclosure; (4) superiority and stability of company performance.

The Global Sustainable Investment Alliance defines “Corporate Engagement and Shareholders”, or more commonly “Engagement”, as the exercise of ownership rights conferred by share ownership aimed at exerting influence on relevant sustainability decisions. More generally, engagement involves the dialogue between investors and companies, and in particular the exercise of voting rights attached to share ownership. The extended notion of engagement tends to refer to dialogue focusing on sustainability issues and is a long-term process aimed at positively influencing company behavior and increasing transparency. For engagement strategy, the time horizon is important: the dialogue between investor and company takes place in the medium to long term, intermediate objectives are identified and progress is monitored constantly.

¹² For overview of fiduciary duty see (OECD, 2017, Appendix 1, pp. 45-50).

Engagement should not be confused with shareholder activism. Engagement, however, is more generally understood as the process through which the investor initiates a structured dialogue with the management of the investee company, based on the monitoring of environmental, social, and governance aspects of the company's activities. Active share ownership is therefore one of the ways a relationship is established between the investor and the issuer.

Influence can be achieved through both informal and formal means of dialogue, in other words, through “soft” or “hard” engagement. Soft engagement practices include (1) regular meetings between company and investor representatives; (2) conference calls; (3) reporting. Hard engagement practices include: (1) the presentation of motions aimed at integrating the agenda; (2) speaking at shareholders' meetings; (3) exercising voting rights on items on the agenda of shareholders' meetings. While soft engagement can be adopted by the investor about any asset class, hard engagement practices are based on share ownership. In fact, active share ownership is a sustainable and responsible investment strategy that relies on the power of influence of investors, through the exercise of the rights attached to participation in the share capital of one or more companies.

The promoters of soft and hard engagement activities are the investors, and the company-investor relationship can be either direct or indirect. In an indirect relationship, it is the asset managers who promote engagement initiatives on behalf of the investors. In general, the engagement process occurs over a medium to a long time.

In the preparatory phase, the investor gathers as much information as possible, relying mainly on rating agencies, ESG consultants, and data providers. The engagement process often starts with a request for information on a controversial issue, or on the ESG profile of the issuer, which the investor addresses directly to the company. This request is always expressed formally, usually in a letter, and to be effective, it should not ask general questions, but precise questions. The ensuing dialogue comprising regular meetings, conference calls, and sending written communications is the core of “soft” engagement.

There are two possible directions in which the initiative may evolve: (1) the company accepts, in whole or in part, the requests and introduces measures to remedy any anomalies; (2) the company refuses to continue the dialogue; where the company accepts the request; this may be followed by: (1) motions on relevant issues on the agenda of the meetings, and where motions are approved, voting rights are exercised; (2) the initiation of collective or joint engagement carried out by investors; this may motivate the company to initiate dialogue; (3) divestment (or exit); (4) public dissent (or advocacy).

Today institutional investors are at the center of the academic debate due to the growing importance of the ownership structures of listed companies, to the extent that there is talk of institutionalization of ownership (Gilson & Gordon, 2013). Institutional investors are often accused of inertia. Inertia can have different explanations. One explanation for institutional investor inertia often identified in the scientific literature is the absence of incentives (Black, 1992; Gantchev, 2013). The portfolio of a mutual fund may for example be too fragmented for each investee to be influenced; moreover, exerting influence might cost more than any benefit. Finally, there may even be a problem of free-riding. For these reasons, traditional investors may opt to exiting the investment rather than exercising their voting and dissenting rights.

Legal uncertainties about engagement also contribute to a fragmented conceptual framework (Del Giudice, 2019). The Shareholders Rights Directive (SHRD) 2007/36/EC, subsequently amended by Directive 2017/28 of 17 May 2017, imposes an obligation on institutional investors to adopt engagement policies and to use transparency criteria on the exercise of voting rights in general and on the most meaningful votes in particular. The 2017 version of the SHRD also sets out the purposes of engagement, i.e., the long-term value creation that shareholders of listed companies should pursue through monitoring and solicitation regarding sustainability issues. In this sense, the legislation appears to be successful in raising the profile of sustainability issues, but the regulatory impact deserves further study.

More generally, regulation is to be understood as a driver of change in sustainability investing. Regulation is playing a fundamental role in the implementation of ESG strategies for institutional investors. OECD articulates that regulatory frameworks for investment governance that are built on risk-based controls and prudential standards do not usually refer explicitly to ESG issues. Although this is changing in several jurisdictions. Regulatory frameworks for the most part do not prevent ESG integration, and other legislation or voluntary codes may encourage institutional investors to take ESG factors into account in their investment governance. Nevertheless, regulatory heterogeneity, procedural and behavioral complexity may discourage ESG integration. In this sense, the EU's IORP Directive (Directive (EU) 2016/2341) should be mentioned. It has the merit of making explicit reference to sustainability (ESG indicators) within the discussion on prudential standards. The Directive clearly recognizes that within the prudent person rule, IORPs may consider the potential long-term effect of their investments on ESG performance.

At the end of this brief discussion of institutional investors' attitudes towards sustainable investments, we offer a concluding reflection.

It is not by chance that today there is growing attention to sustainable and responsible investments in the world of finance. After all, the World Economic Forum finds that in just 10 years, global risks have shifted from being solely economic to being primarily environmental and social. And these risks, because the extent of economic and financial damage they can cause has grown, have become more frequent and more significant.

For institutional investors, the way forward is clear: they will increasingly need to incorporate an ESG approach as an integral part of their investment process. There are many reasons for this. They lie in regulatory requirements, the quest for long-term performance, growing demand from savers, and, more generally, the characteristics of institutional investors (i.e., high asset under management, professional skills, potential activism), that make them candidates for change. Europe has played a key role in regulatory requirements in recent years by passing new far-reaching legislation. And ESG has implications in terms of both profitability and stakeholder reputation for the pursuit of satisfactory performance.

Although the global pandemic has forced some companies to temporarily reduce their focus on sustainable issues, institutional investors still strongly believe in a solid ESG strategy.

The fourth annual report “Edelman trust barometer: Institutional investors” (Edelman, 2020)¹³ finds that 88% of respondents believe that companies that prioritize ESG initiatives offer the best long-term return opportunities. It is true that 79% say their companies are temporarily deemphasizing ESG as an investment criterion, and 77% believe the companies they invest in are doing the same, due to the economic impact of COVID-19. But 92% of respondents still say that companies with strong ESG performance deserve a premium valuation on their share price, and 96% of business owners and 93% of investors expect their companies and the companies they invest in to increase their focus on sustainable issues.

Additionally, social issues became the top priority of the three ESG elements of environmental management, social issues, and corporate governance in 2020, up by 15 percentage points from 2019. Social issues including workforce, human capital management, corporate culture, and employee composition, health, and safety rose from third to first place.

¹³ The 2020 Edelman Trust Barometer Special Report: Institutional Investors identifies pivotal issues shaping investment criteria and how companies can build trust with the investment community. The report surveys 600 institutional investors in six countries representing firms that collectively manage over \$20 trillion in assets. The survey was run from 3 September to 9 October, 2020 (Edelman, 2020).

Ninety-two percent of respondents agree “strongly” (44%) or “somewhat” (48%) that attention to diversity and inclusion (D&I) issues can have a positive impact on the share price. Almost two-thirds, 63%, believe that disclosing employee D&I data positively affects company confidence, up 11 percentage points from the previous year. All of these factors had a strong impact on investment decisions, with seven out of 10 investors applying D&I-based exclusion criteria. Besides, the majority of respondents believe that companies should focus on positive change in society. A total of 76% believe that a high level of trust is important for companies to effectively manage the crisis (“fundamentally important” (33%) and “important” (43%).

In general, the trends reflect a growing recognition of the importance of making global finance sustainable. Climate change and ethical standards of development are the elements of greatest concern (Boffo & Patalano, 2020).

Retail investments: Strategies for responsible and sustainable mutual funds

Sustainable investing is an investment approach that considers environmental, social, and governance (ESG) factors in portfolio selection and management. The goal of sustainable investing is to maximize the risk-return profile of the investment according to ESG criteria in a long-term horizon. In particular, the ESG criteria are used for the initial screening and selection of security issuers and the consequent management of the investment portfolio. Sustainable investments are also marketed as socially responsible investment products. Table 2.14 lists common ESG factors that are considered in sustainable investments.

Table 2.14. Examples of ESG factors

environmental criteria	social criteria	governance criteria
energy consumption	human rights	quality of management
pollution	child and forced labor	board independence
climate change	community engagement	conflicts of interest
waste production	health and safety	executive compensation
natural resource preservation	stakeholder relations	transparency & disclosure
animal welfare	employee relations	shareholder rights

Source: Authors’ own elaboration.

Retail sustainable investments are concentrated in sustainable and responsible mutual funds (SR funds), which are professionally managed portfolios considering ESG criteria to generate a long-term competitive financial return.

SR funds may be distinguished into passive funds, which seek to replicate in the asset allocation the composition of an ethical index, e.g., the Dow Jones Sustainability Indices¹⁴ or the Ftse4Good Indices¹⁵, and active funds, with active investment management that selects the eligible universe on the base of ESG analyses, applying different potential investment strategies. In other words, the application of the ESG criteria results in this case in the selection of the investment universe, with inclusions and/or exclusions of various issuers according to the specific sustainable approach selected by the asset manager (Boffo & Catalano, 2020).

SR funds are mainly publicly offered open-end funds, investing in tradable securities and money market products. They are most widespread in Europe, but Japan and Australia are the areas where they are increasing most rapidly, due to changes in their sustainable investment markets (Eurosif, 2018). However, retail SR funds are continuing to increase, all over the world, in terms of assets under management, asset management companies involved, as well as approaches used for portfolio selection and management (Vigeo Eiris, 2016; Global Sustainable Investment Alliance [GSIA], 2018).

Regarding this last point, based on a general strategy that integrates ESG factors into the analysis of securities, SR fund managers implement and sometimes combine the following different approaches (Eurosif, 2018):

1. Negative/exclusionary screening: it implies the exclusion from a fund or portfolio of certain sectors, companies, or countries based on specific ESG criteria.
2. Positive/best-in-class screening: the portfolio invests in sectors, companies, or countries selected for positive/better ESG performance compared to peers.

¹⁴ The Dow Jones Sustainability Indices (DJSI), launched in 1999, are a family of indices evaluating the sustainability performance of thousands of companies trading publicly, operated under a strategic partnership between S&P Dow Jones Indices and Robeco SAM (Sustainable Asset Management). They are the longest-running global sustainability benchmarks worldwide and have become the key reference point in sustainability investing (<https://www.spglobal.com/esg/performance/indices/djsi-index-family>).

¹⁵ The FTSE4Good Index Series is designed to measure the performance of companies demonstrating strong ESG practices. Transparent management and clearly-defined ESG criteria make FTSE4Good indexes suitable tools to be used by a wide variety of market participants when creating or assessing sustainable investment products (<https://www.ftserussell.com/products/indices/ftse4good>).

3. Norms-based screening: the investments are selected according to the analysis of business practices based on international norms and standards.
4. ESG integration: the systematic and explicit inclusion of ESG factors in financial analysis by investment managers.
5. Corporate engagement and shareholder action: the use of shareholder power to influence corporate behavior, including voting and proxy voting at the annual shareholder meeting, communicating with the top management of the companies, monitoring ESG activities, and making shareholder proposals.
6. Impact/community investing: the investments, typically made on private markets, are target at solving social or environmental problems, by producing a quantifiable positive impact. This includes community investing, where capital is specifically directed to traditionally underserved individuals or communities.
7. Sustainability themed investing: investments in themes or assets specifically related to sustainability (for example, clean energy, green technology, and sustainable agriculture).

The retail investor should verify the specific strategy implemented by the different SR funds, to select the product according to his/her specific needs and investment objectives. The retail investor must be aware that products generally labelled as “sustainable”, or “responsible”, or “ethical”, or “green” can be characterized by a different degree of severity in the selection and management of securities. SR funds are not all alike. There are harder and softer funds from a sustainability point of view. It is necessary to exclude greenwashing policies adopted by asset management companies and to compare funds in terms of approaches adopted in the asset allocation.

In this subsection, each different approach is briefly analyzed.

The criterion of negative screening is based on the exclusion from the fund portfolio of certain sectors, companies, countries, or more in general, disapproved practices. The most common types of companies excluded are those involved in the production or trade of weapons and armaments, nuclear energy, pornography, alcohol, tobacco, gambling, animal testing, and intensive farming. Bonds and equities issued by companies operating in these sectors are excluded thanks to the application of negative screening. The exclusion process typically includes an evaluation of how much company revenue, or profit, is generated by the excluded product or practice. It can also be used to exclude government bonds from countries with a regime that fails to guarantee fundamental freedoms and

rights. For example, excluded States are those violating human, civil and political rights, governed by oppressive regimes, practicing the death penalty, or participating in military operations not authorized by supranational organizations. This strategy has shown exponentially consistent growth over the years, and it is the most popular strategy in terms of assets under management for SR funds (Eurosif, 2018).

Unlike negative screening, positive screening identifies companies that positively contribute to sustainable development over the long term. Corporations that are likely to be included in sustainable and responsible funds are therefore those which comply with social and environmental policies by using, for example, renewable energies, minimizing pollution in their production processes, or increasing the level of transparency towards stakeholders. Internal policies governing areas such as relations with employees, gender equality, and working conditions are also taken into consideration. In particular, for the environment, the selection favors enterprises that are sensitive to the environmental impact of their products and production processes, attentive to waste recycling, using energy-efficient heating systems, and with low levels of pollution. Positive screening can select States according to the investments in the protection of environmental heritage, as well as animal and plant species. However, social sustainability is the ability to guarantee conditions of well-being (safety, health, training) for all the stakeholders, especially the employees. SR funds primarily evaluate respect for human rights. But the relevant issues range from the formation of human capital to the promotion of equal opportunities and the health, safety, and well-being of employees, beyond legal obligations. The issue of human rights is key especially for multinational enterprises operating in developing countries and regards non-discrimination, respect for freedom of association, fight against child labor and forced labor, and protection of the indigenous peoples, along with the Universal Declaration of Human Rights, adopted by the UN General Assembly in 1948. The area related to the corporate system essentially refers to the complex set of relationships between the top managers of a company, its board of directors, and its shareholders. The good governance practices concern in particular the enterprises, regarding for example the composition of the board of directors, the level of administrative transparency, the absence of corruption and conflicts of interest, independence of the board. Nevertheless, also the States are more and more evaluated considering the modalities with which they are governed, analyzing for example the commitment to safeguard and promote peace through diplomatic dialogue, to support the less developed countries, as

well as the areas affected by wars or natural disasters, to reduce the level of corruption in government structures (Boffo & Catalano, 2020).

Within the positive screening strategy, a best-in-class approach can be adopted. This consists of evaluating the ethical performance of the issuer in comparison with industry peers. The ESG analysis assigns a score to each area – environmental, social, governance – and the three scores determine the overall social responsibility score (or ethical rating) of the issuer. This score must exceed a certain threshold to ensure that the issuer's securities are invested by the SR fund.

The norms-based approach allows investors to select issuers according to their adherence to global norms or standards. Norms-based screening involves either defining the investment universe based on investees' performance on international norms related to ESG issues or excluding investees from portfolios if they are not compliant with specific rules or standards. The most common norms-based screen includes but are not limited to the UN Global Compact Principles, the Universal Declaration of Human Rights, International Labour Organization Standards, the United Nations Convention Against Corruption, and the OECD Guidelines for Multinational Enterprises (Eurosif, 2018).

The strategy called ESG integration aims to detect opportunities and threats of ESG factors for the profitability and the stability of the issuer. Asset managers consider several criteria under each of the three factors (Environment, Social, and Governance), and include them in the traditional financial analysis.

The management of SR funds can include engagement and voting activities. This is not a strategy for asset selection, but it follows the composition of the investment portfolio. Indeed, the asset management company's legal representative or the members of its Board of Directors can represent the equity fund's shareholders at the annual general meeting of issuers in which the funds invest. A responsible investing approach seeks to influence companies included in the fund portfolio by dialogue with them and by using voting rights at shareholders' meetings to guide strategic and operational choices in a more ethical direction. This approach can contribute to making the issuers compliant with ESG criteria (PRI, 2019).

Another approach applied by funds can be the so-called impact investing, where investments are aimed at generating a quantifiable social and/or environmental impact alongside a financial return. In particular, to identify an impact investment, three requirements are needed: intentionality, measurability, and addition-

ality. First, the impact must be objectively measurable and must be intentionally produced. Furthermore, the investment must be directed to undercapitalized areas excluded by any other financial operator (for example, refugees, niches such as disability). Impact investing includes community investing. In this case, capital is specifically directed to traditionally underserved communities or organizations that have a track record of social responsibility through helping a community. The funds allow these organizations to provide specific social services, such as affordable housing. The goal is to improve the quality of the communities by reducing their dependency on government assistance. Retail investors in search of long-term returns can choose impact investing for its ethical approach and its potential to contribute to sustainable development. However, among the obstacles to impact investments, four main factors have been identified: lack of viable products and options, risk concerns, performance concerns, and lack of qualified advice/expertise (Vigeo Eiris, 2016; GSIA, 2018). Impact investing is a small but vibrant segment of the broader sustainable and responsible investing universe. Although it remains the least used strategy, it has seen the fastest growth in recent years (Eurosif, 2018).

A further strategy that an SR fund can adopt is sustainability-themed investing. This approach implies that a specific sustainability topic is a theme for investing. Rather than an overall ethical approach, this strategy targets one particular megatrend and invests solely in companies related to it. In general, thematic funds focus their investments across one or more sectors related to a common theme, such as green technology, waste and water management, sustainable agriculture, green transports or energy efficiency (Climate Bonds Initiative [CBI], 2016; European Commission, 2016; Nicholls, 2015; Willis Towers Watson, 2012). Current main trends around the world can be identified concerning United Nations' Sustainable Development Goals (SDGs)¹⁶. Indeed, an increasing number of investors are now seeking investments that offer solutions to such challenges, generating both environmental and social benefits as well as attractive financial returns.

These strategies can also be implemented in combination with each other. Combined approaches might include for example (PRI, 2019): (1) Establishing a sustainable agriculture thematic fund that screens out companies involved in producing tobacco and uses integrated analysis to select companies for inclusion in the fund; (2) running a fund that applies 20 negative screens to determine the

¹⁶ In September 2015, 193 governments belonging to the UN fixed 17 common objectives for international development, which can be reached through the mix of economic growth, social inclusion, and positive environmental impact (United Nations, 2015).

investible universe and uses integrated analysis to select companies for investment from within the investible universe; (3) running a global equities fund using integrated analysis to select stocks combined with a norms-based approach, investigating any serious alleged breaches of selected international norms, and divesting companies found to be in serious breach of a norm (often after engagement).

The strategies adopted, also in combination with each other, make it possible to define the SR fund's eligible portfolio, i.e., the set of securities within which the asset manager can select the securities to be effectively included in the investment portfolio from time to time.

The applied investment strategy and the asset manager's choices in terms of picking and timing impact the returns produced by the SR fund for the retail investor, following the specific risk-return profile that characterizes the product.

The psychology of financial planning: The impact on retail investors

The investments in retail SR funds have not charitable objectives but aim to achieve a financial return together with greater attention to ESG practices. They allow investors to allocate capital consistently with their values and principles.

According to a research carried out in 2020 by CONSOB and University Roma Tre, around 40% of Italian investors declare to keep in consideration of the environmental impacts of their financial decisions. Regarding investment choices, between financial aspects (return, risk, costs) and sustainability profiles (impact on the environment, elimination of inequalities, respect for anti-corruption regulations, etc.) the priority for retail savers is still predominantly placed on the financial aspects. Nevertheless, an increasing number of investors are aimed to obtain financial benefits without prejudice to sustainability or are interested in sustainability without compromising the financial returns. Then, for many investors, the goal to generate returns is confirmed, but without violating the own social conscience. In this context, environmental issues mainly solicit the sensitivity of most clients and financial consultants (CONSOB, 2020b).

These results can be different if the analysis refers to investors or non-investors in SR funds. Indeed, among investors, the emotional and ethical factors ("feel good", "personal values", "social consideration") tend to prevail compared to financial features.

In general, the sustainability factors are entering the investment choices of many savers and, according to the European Securities and Markets Authority (ESMA) guidelines, the investors' preference for ESG factors has to be detected by the financial consultants on the investment adequacy assessment carried out during the advisory activities.

The orientation towards long-term sustainable investments can be more relevant in specific economic phases and social contexts. In the recent past, an important and sudden change in the psychology of financial planning comes from the spread of the coronavirus pandemic.

Starting from the first quarter of 2020, households showed a fall in consumption and significant growth of precautionary savings. The financial wealth of households with lower incomes is decreased in the recent past to meet the liquidity needs arising as a result of the reduction in revenues. Since the high volatility weeks corresponding to the outburst of the COVID-19 crisis, many investors have changed their financial behaviors, also due to the widespread pessimism about the economic recovery. The crisis has impacted household holdings of financial assets, strengthening the long-lasting trend of an increasing preference for liquidity to the expense of bonds, equities, and fund shares. Besides, the psychological and behavioral repercussions of the crisis have led to an increase in more prudent and long-oriented investments. Retail investors nowadays perceive a profound uncertainty and vulnerability concerning unforeseen events and most believe it is necessary to act with caution on the economic and financial front. In this context, the outbreak of the pandemic has increased the interest in ESG products.

The growth in demand for SR funds has been very strong in the recent past, but the sustainable finance market still has some limitations which hinder its full development.

What are the main factors that still keep many investors away from sustainable investments?

The first one concerns doubts about the risk-return profile of sustainable products. During the last fifteen years, literature about sustainable investing has focused especially on the differences in terms of risk and performance between SR funds and conventional ones. More recently, some studies focused on the comparison of the risk/returns produced by different sustainable strategies.

Scholars and financial operators aim to verify if SR funds are condemned to an ethical sacrifice in terms of returns because of their portfolio constraints. Al-

though some authors found some indications of a potential underperformance of ethical funds in certain countries (Renneboog, Ter Horst, & Zhang, 2008b), several studies confirmed an equivalence between SR funds and conventional ones in terms of risk-adjusted performance measures and portfolio characteristics (Bello, 2005; Das & Rao, 2014; In, Kim, Park, Kim, & Kim, 2014; Kreander, Gray, Power, & Sinclair, 2005; Renneboog, Ter Horst, & Zhang, 2008a). The general evidence shows that investors can add social screens to their investment choices without compromising financial performance (Bauer, Koedijk, & Otten, 2005). Indeed, the number of stocks included in the portfolio of sustainable funds can be large enough to eliminate the problem of ethical sacrifice. Screening criteria limit potential investments in some ways, but allow wide diversification at a geographical level and across sectors. Since the security contribution to market portfolio variance is mainly given by the weighted sum of covariances of security with other covariances, when the number of assets increases, the weight of the security contribution becomes smaller. When the potential investment universe is large enough, the risk-return frontier aligns with the frontier for conventional investments. In other terms, if the asset manager creates a sufficiently diversified portfolio, the mutual fund will only be exposed to systematic risk, and the ethical sacrifice tends to disappear.

Consequently, according to the literature, the SR funds make it possible to obtain, in the medium-long term, risk-adjusted performances comparable to conventional funds.

Other than the fear of potential returns below expectations or only after a long time, other factors that can discourage responsible investment are the lack of a commercial proposal by consultants and financial institutions, the fear that it corresponds just to marketing operations, and the lack of basic knowledge and information about the specific topic.

As an example, Italian investors do not seem to be aware of ESG products yet. The CONSOB Observatory on 'The approach to finance and investment of Italian households' includes a section dedicated to sustainable and socially responsible investments. According to data collected, in terms of knowledge, possession, and attitudes of retail investors, the Observatory shows that sustainable products are still little known alternatives, also if the percentage of investors who declares to know the sector is growing. In the same way, the share is increasing of those who respond that they have received an explicit recommendation to invest in SRI by their consultant (CONSOB, 2020a).

Other than general information on sustainable products, consultants perceive the importance for customers of having a synthetic cost indicator for responsible investment, the availability of one certification confirming its ESG nature, information for comparing sustainable products with other similar investments, as well as details on their ESG characteristics (CONSOB, 2020b).

Thanks to regulatory requirements regarding transparency and adequacy assessment, the dialogue between financial consultants and retail investors on the subject of ESG investments is likely increasing. This will mitigate some of the problems relating to basic knowledge, consultancy, and commercial offers on the subject denounced by many investors. An analysis of the main regulation about disclosure in sustainable finance is analyzed in the following section.

The effects of the regulation on retail investors

From the investor's point of view, one of the main problems related to sustainable investing is represented by the risk of greenwashing, which identifies the risk that the approach followed in the selection and management of the portfolio is not genuine but conditioned by commercial and marketing policies. The risk is that behind the sustainable product label, there is an investment portfolio poorly selected according to a real ethical assessment.

In Europe, the legislation in the field of sustainable finance is intervening for the main purpose to increase the levels of disclosure of market participants, and then reduce the risks of greenwashing.

First, the Directive 2014/95/EU, also known as the Non-Financial Reporting Directive (NFRD), requires large EU “public interest” corporates to publish data on the impact their activities have on ESG factors. It lays down the rules on disclosure of nonfinancial (including sustainability and environmental disclosure) and diversity information by large companies, required to include nonfinancial statements in their annual reports from 2018 onwards (Directive 2014/95/EU).

Nonfinancial disclosure represents nowadays the main tool to communicate the corporates' commitments toward sustainability. Thanks to this regulation, asset management companies can rely on nonfinancial reporting produced by many companies to define the level of sustainability of the issuers and make proper decisions concerning the investment portfolio of the SR funds. As most retail SR funds are open-ended mutual funds that invest in listed companies, the asset management company has the opportunity to refer to nonfinancial reporting to

deepen the analysis of the actual level of sustainability of each issuer. In particular, EU rules on nonfinancial reporting apply to large public-interest companies with more than 500 employees, covering approximately 6,000 large companies and groups across the EU, including listed companies, banks, insurance companies, and other companies designated by national authorities as public-interest entities. Besides, to improve the valuation of the firm from an ESG perspective by asset management companies and other institutional investors, several issuers have incentives to voluntarily provide information regarding their engagement in sustainable practices. This incentive can characterize also corporates excluded by the target of the Non-Financial Reporting Directive.

Mandatory or voluntary sustainability reporting is often integrated into annual reports or enclosed in specific CSR documents provided by the companies on their websites.

To increase the level of knowledge on issuers' behaviors and practices, financial institutions that manage SR funds typically use a range of external ESG research providers in combination with in-house sustainability analysis to formulate ESG-integrated investment decisions.

Even a high level of information that the asset manager can access, however, is not able to assure the retail investor that investment decisions are taken by applying effective sustainability criteria. For this purpose, first, regulators must define clearly and unambiguously what is meant by sustainable activity. Without commonly accepted standards on how to define what is "sustainable", there is a strong incentive for asset managers to make controversial assets look sustainable.

As discussed in Subchapter 2.1.4, the Regulation EU 2020/852 (EU Taxonomy Regulation) introduced standards for understanding what can be a target for sustainable investments (Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020). In particular, this European classification system provides a green list, containing all the activities that can be considered sustainable from an environmental point of view, according to standardized definitions (Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019). Thanks to this taxonomy, asset management companies can analyze the nonfinancial reporting data and consequently classify whether an investment is environmentally sustainable.

Moreover, European regulators introduced standardized processes to be implemented by market operators in the field of sustainable finance, to increase their level of transparency. In particular, according to the Regulation EU 2019/2088,

also known as Sustainable Finance Disclosure Regulation (SFDR), asset management companies and other financial operators have to disclose ESG and taxonomy-related analysis on firm websites and in pre-contractual documents as well as periodic reports. The EU Taxonomy Regulation is then integrated with the sustainability-related disclosures in the financial services sector.

According to this regulation, financial market participants and financial advisers must provide the information necessary to enable retail investors to make informed investment decisions (genuinely sustainable rather than greenwashed products).

More in detail, SFDR lays down harmonized rules for financial market participants and financial advisers on transparency with regard to the integration of sustainability risks and the consideration of adverse sustainability impacts in their processes. Moreover, this regulation asks for the provision of sustainability-related information concerning financial products offered by financial operators.

The goal of SFDR is to reduce information asymmetries in principal-agent relationships by requiring financial market participants and financial advisers (agents) to make pre-contractual and ongoing disclosures to end investors (principals).

The SFDR rules are broken down into mandatory and “comply or explain” rules, introducing disclosure requirements at the entity level and product level.

Considering the transparency rules at the entity level, the financial operators have first to disclose the integration in their processes of sustainability risks. A sustainability risk means an environmental, social, or governance event or condition that, if it occurs, could cause a negative material impact on the value of the investment. In particular, financial market participants shall publish on their websites information about their policies on the integration of sustainability risks in their investment decision-making process. In the same way, financial advisers shall publish on their websites information about their policies on the integration of sustainability risks in their investment advice or insurance advice. The pre-contractual documents have to disclose how sustainability risks are integrated into the investment decisions/advice, and the results of the assessment of the likely impacts of sustainability risks on the returns of the products the financial operators make available/advise on. Where financial market participants/advisers deem sustainability risks not to be relevant, the documents shall include a clear and concise explanation of the reasons therefor.

The other information to be provided at the entity level concerns potential adverse sustainability impacts. Financial market participants shall publish and maintain on their websites: (a) where they consider principal adverse impacts of investment decisions on sustainability factors, a statement on due diligence policies concerning those impacts, taking due account of their size, the nature and scale of their activities and the types of financial products they make available; or (b) where they do not consider adverse impacts of investment decisions on sustainability factors, clear reasons for why they do not do so, including, where relevant, information as to whether and when they intend to consider such adverse impacts. In the same way, financial advisers shall publish and maintain on their websites: (a) information as to whether, taking due account of their size, the nature and scale of their activities, and the types of financial products they advise on, they consider in their investment advice or insurance advice the principal adverse impacts on sustainability factors; or (b) information as to why they do not consider adverse impacts of investment decisions on sustainability factors in their investment advice or insurance advice, and, where relevant, including information as to whether and when they intend to consider such adverse impacts.

Other information has to be provided at the product level. In particular, this regulation defines sustainable investment as an investment in:

- an economic activity that contributes to an environmental objective, as measured, for example, by key resource efficiency indicators on the use of energy, renewable energy, raw materials, water, and land, on the production of waste, and greenhouse gas emissions, or on its impact on biodiversity and the circular economy;
- an economic activity that contributes to a social objective. In particular, an investment that contributes to tackling inequality or that fosters social cohesion, social integration, and labor relations;
- human capital or economically or socially disadvantaged communities,

provided that such investments do not significantly harm any of those objectives and that the investee companies follow good governance practices, in particular concerning sound management structures, employee relations, remuneration of staff, and tax compliance.

For pre-contractual disclosures in periodical reports regarding each sustainable product, the regulation distinguishes between the requirements for financial products which promote environmental or social characteristics and financial

products which have as an objective a positive impact on the environment and society. Article 8 of the Directive disciplines the so-called light green products, whereas Article 9 the so-called dark green products.

Financial market participants/advisers shall publish and maintain on their websites the following information for each financial product referred to in Article 8 and Article 9: (a) a description of the environmental or social characteristics of the sustainable investment objective; (b) information on the methodologies used to assess, measure and monitor the environmental or social characteristics or the impact of the sustainable investments selected for the financial product, including its data sources, screening criteria for the underlying assets and the relevant sustainability indicators used to measure the environmental or social characteristics or the overall sustainable impact of the financial product.

Financial operators are called to increase the disclosure on the environmental or social characteristics of sustainable investments, with a different degree of depth and details depending on the type of product managed and offered. The higher the level of sustainability declared for the product, the more information must be provided to investors.

Conclusions

It is not by chance that today there is growing attention to sustainable and responsible investments in the world of finance. After all, in just 10 years, global risks have shifted from being solely economic to being primarily environmental and social. For institutional investors, the way forward is clear: they will increasingly need to incorporate an ESG approach as an integral part of their investment process. There are many reasons for this. They lie in regulatory requirements, the quest for long-term performance, growing demand from savers, and, more generally, the characteristics of institutional investors (i.e., high amount of assets under management, professional skills, potential activism), that make them candidates for change.

Also retail investors are more and more interested in sustainable and responsible financial instruments. For this reason, sustainable products with various degrees of ambition have been developed to date by asset management companies and other financial institutions. Thanks to the new regulation on sustainable finance introduced in Europe, investors should have the opportunity to know the actual level of sustainability of different financial products, also in the light of the EU

taxonomy. Indeed, the current regulation in the field of sustainable finance has introduced new rules on the disclosure related to these products so that the investor can effectively make informed investment decisions. Accessing this information, also the retail investor can play his/her part in the fight against climate change or social injustices.

A high level of disclosure is essential both for distinguishing genuinely sustainable rather than greenwashed products, but also for understanding the differences between various responsible financial investments. For example, sustainable and responsible mutual funds can implement different sustainable strategies that are able to produce significant consequences in the structure and contents of their financial portfolios.

The recent and extensive regulation enacted at the European level will presumably have a significant impact even beyond continental borders, helping to guide the flow of international investments, the operating practices of financial intermediaries, and the activity of supervisory Authorities globally.

KEY TERMS

Institutional investors, retail investors, ESG, engagement, sustainable and responsible investing, greenwashing, positive screening, negative screening, Non-Financial Reporting Directive, Sustainable Finance Disclosure Regulation.

SUBCHAPTER SUMMARY

The Subchapter focuses on institutional and retail investors' attitudes towards sustainable investments, which aim to achieve a financial return together with greater attention to environmental, social, and governance (ESG) practices.

Institutional investors are a key component of modern financial systems. The lowest common denominator among them is the professional practice of asset management on behalf of several individuals. Nowadays, increasing numbers of institutional investors recognize ESG factors as value drivers. As a result, institutional investors can also play a key role in sustainability issues. Also for many retail investors, the goal to generate returns is confirmed, but consistently with their values and principles. The interest in sustainable products has recently grown also due to the spread of the coronavirus pandemic that produced a sudden change in the psychology of financial planning.

Still, responsible investors and sustainable products are not all the same.

The OECD identifies four types of institutional investors, by considering how they integrate ESG factors into their investment portfolio decisions. Indeed, there are several different investment strategies through which institutional investors take account of ESG factors in their portfolio construction. In the same way, mutual funds dedicated to retail investors can apply different strategies for asset selection and portfolio management.

In Europe, the legislation in the field of sustainable finance is intervening for the main purpose to increase the levels of disclosure of responsible financial products, and then reduce the risks of greenwashing, in particular for the benefit of retail investors. According to this regulation, financial market participants and financial advisers must provide the information necessary to enable retail investors to make informed investment decisions (genuinely sustainable rather than greenwashed products).

DISCUSSION QUESTIONS

1. What are the special characteristics of an institutional investor?
2. What are the strategies for integrating ESG factors into the portfolios of institutional investors and mutual funds?
3. What does “engagement” mean? How does it relate to the integration of ESG factors?
4. What are the main factors that still keep many investors away from sustainable investments?
5. What does “greenwashing” mean?

TEACHING METHODS

- lectures,
- workshops,
- open group discussions,
- student presentations,
- gamification.

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3



Solutions. Towards sustainable economy

3.1. Circular economy

Aneta Vasiljevikj-Shikaleska^a, Zanina Kirovska^a, Biljana Gjozinska^a

LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- understand the challenges for transitioning to a more resource-efficient and circular economy.
- discuss the impact of circular economy on sustainable development,
- recognize and discuss how materials and energy flow through the economic system,
- identify different circular economy models,
- recognize different strategies to achieve higher circularity, including resource and waste management, clean production and industrial ecology,
- use the relevant circular economy indicators for assessing the successfulness of circularity,
- independently search for relevant information connected to circular economy issues, analyze it and deliver it in a form of a written report.

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Introduction

The circular economy (CE) is an attractive, smart and innovative economic concept for exchange and production but associated with decoupling economic growth and material dependency. Traditional linear consumption patterns, where consumers take, produce, consume, and waste resources are coming up against constraints on the availability of resources (Ellen MacArthur Foundation, 2013). Therefore, the new economic pattern of the circular economy by addressing many of today's fundamental challenges and focusing on the transition towards more sustainable economy has received increased attention among the academia, business community and the policy makers.

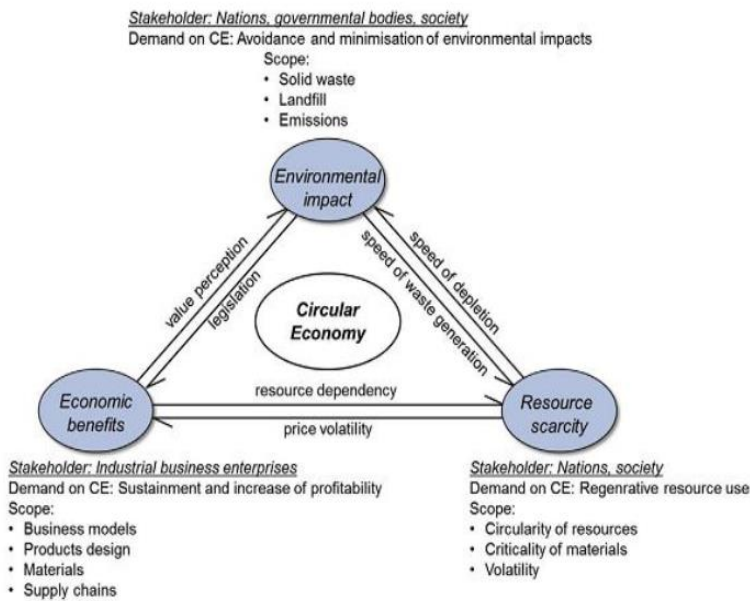
The main purpose in the circular economy is to reduce the adverse interactions between the economy, the environment and its natural resources by decoupling resource use and environmental impact from economic activities; tracking material flows and measurement of resource efficiency and waste reduction which, however, will enable more efficient usage of goods by taking into consideration the repairing and reusing processes (EASAC, 2016). The systems in circular economy are created to be regenerative so that it is enabled for the materials each time, after the use, to be returned into the cycle and used again as secondary materials (GEEP, 2020). Thus, by closing the cycles of matter and energy, converting the waste into resource and transforming the economic activities from carbon-intensive manufacturing to more sustainable production and consumption, the growth of economy while reducing extractions from the natural environment is enabled.

The challenges on the resource side are compounded by rising demand from the world's growing population which will undoubtedly cause scarcity of resources, higher price levels and more volatility in many markets. On the contrary, the aims of circular economy are to enable greater resource productivity, higher energy savings and lower greenhouse gasses emission as well as to create local jobs and opportunities for social integration (EC, n.d.). It means that by using fewer resources per economic emission unit on the input side, and from the resources used, the environmental impacts on the emission side would decrease exponentially (Fogarassy & Finger, 2020).

The concept of circular economy integrates the knowledge of the engineering sciences which are closely related to industrial ecology, industrial ecosystems and clean and efficient production, and the environmental economics which is focused on efficient use of the waste by its recovery, reusing and recycling. The

successful implementation of the concept of circular economy greatly depends on the mutual interaction among all parties, the consumers, companies, industries, governments, nations and the overall society. The interaction that must exist between governments, society, and the business sector is illustrated in Figure 3.1.

Figure 3.1. Integral approach of the circular economy



Source: Sánchez-Ortiz, Rodríguez-Cornejo, Del Río-Sánchez, & García-Valderrama (2020).

The European Commission has issued several communications with the aim of having the different member countries legislate and implement the necessary policies to facilitate the application of the principles of CE in different sectors of the economy (Sánchez-Ortiz, Rodríguez-Cornejo, Del Río-Sánchez, & García-Valderrama, 2020).

The main purpose of this Subchapter is to make an overview of the concept of circular economy and its connections to sustainability so that it will provide a better understanding and support for effective implementation of circular economy. It will also give information about the most common circular economy business models and practices and the circular economy indicators used for measuring the level of circularity as well. The financial instruments for supporting the circular economy will be addressed as well.

Circular economy concept and key principles

Concept

One of the major global concerns nowadays is the environmental burden arising from the population growth, environmental degradation and resource scarcity. It was estimated that over 90% of the raw materials used on a global level are not returned back into the economy which causes overexploitation of the natural resources of our planet and burdens our climate. The greenhouse gas emissions and pollution have also reached very high levels, putting human livelihoods, food security, biodiversity and the general well-being of the planet at risk. The transfer from the linear economy model of producing and using goods and services (take, make, dispose) to circular solutions (make, (re)use, recycle) is a way to overcome global sustainability problems and achieve balance among the economic development, environment and resources (Centre for Sustainable Consumption and Production [CSCP], n.d.).

By embedding the 3R principle (Reduce, Recycle, Reuse) of materials and energy into production and consumption process, the use of raw materials and primary energy input will be minimized and the load on natural resources will be reduced. The data obtained from the UN Environment Statistics show that a fully circular economy would reduce the resource use by 28% and carbon emissions by 72% (CSCP, n.d.).

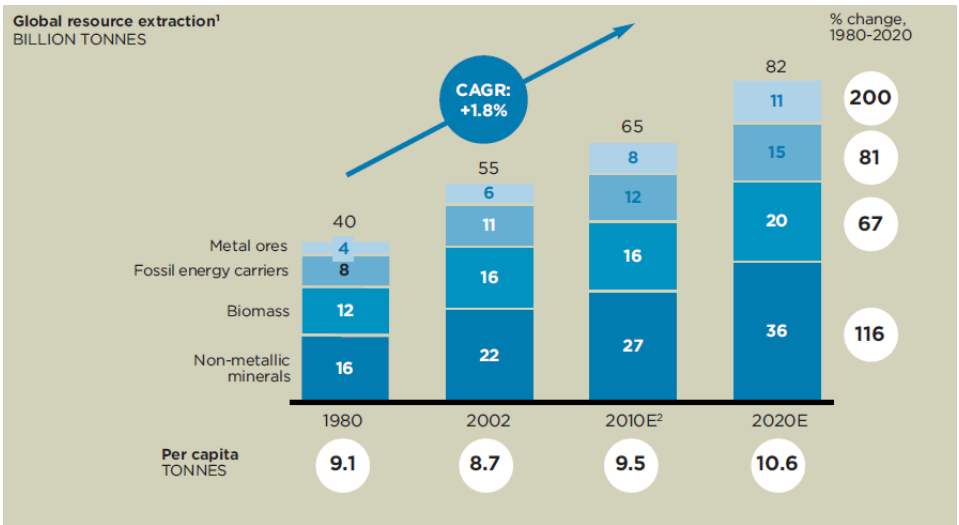
According to Zhu and Qui (2007), the circular economy concept considers the low demand and consumption, low emissions of greenhouse gasses, efficient use of water and energy in production, and maximal utilization of renewable resources as the most important. Reduction means to minimize the use of primary energy and raw materials as inputs and waste discharge as output of the production and consumption. Reuse refers to: 1) reusing the byproducts and waste from one stage of the production in another, thus enabling usage to their maximal capacity; and 2) prolonging the utility time of the product and service in the process of design and production. Recycling is to transform the waste materials into new economic resource by physical and chemical process and use it again in production (Liu, Tong, & Xu, n.d.).

The main idea of the circular economy was to change the currently prevailing linear economic system of “take-make-waste” so that the natural resource use and waste of natural capital are decreased. So far, the natural resources are extracted and used to create products which are then consumed and subsequently

disposed after usage. After usage, products are regarded as “waste” although they still contain a valuable amount of resources. As a result of the growing population and increased consumption the finite natural resources will reach their limits much earlier. Hence, it is important to know how much resources we can extract as well as how much “waste” we can emit back into the system.

The results in the study of Ellen MacArthur Foundation (2013) indicated that 65 billion tonnes of raw materials entered the economic system in 2010 and assumed they would amount to about 82 billion tonnes till 2020 (Figure 3.2). At the End-of-Life, most of the materials (60%) were either incinerated or land-filled. Only 40% of the materials were used recycled or reused (Ellen MacArthur Foundation, 2013).

Figure 3.2. Global resource extraction



Source: Ellen MacArthur Foundation (2013).

The shift from the current linear economic model to a circular economy means not only recycling the materials as much as possible after their usage-phase, but also includes (Impoco, 2017):

- elimination of the use of toxic substances,
- strategies for enhancing the reuse, remanufacturing, repair and recycling of products,
- strategies for stimulating and supporting new consumption patterns,

- establishing new business models closely related to the circular economy principles.

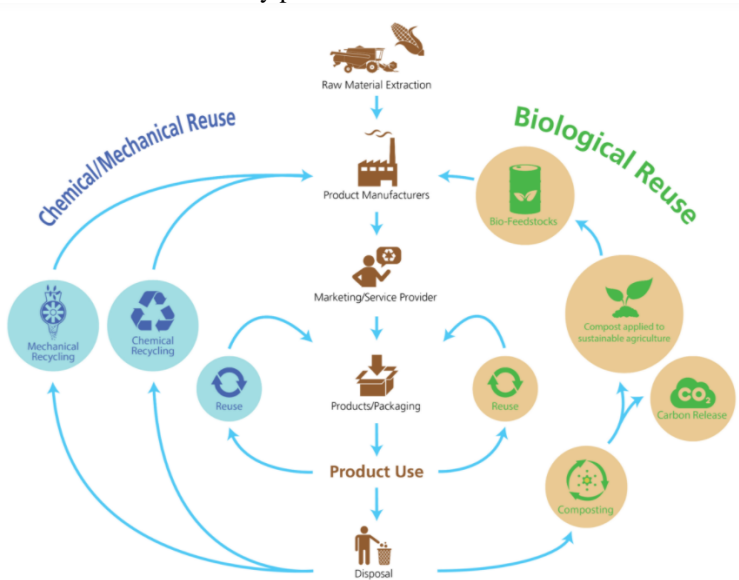
As shown in Figures 3.3 and 3.4, the main difference between the linear and circular economy is the material flow pattern and the flux in economic activity.

Figure 3.3. The linear pattern of traditional economy



Source: Liu, Tong, & Xu (n.d., p. 5).

Figure 3.4. The circular economy pattern



Source: <https://circlesolutions.com/circular-packaging/?gclid=CjwKCAiAjp6BBhAIEiwAkO9>

Regarding different aspects and cyclical dependencies, there are two types of circular cycles: technological and biological (Figure 3.4).

The technological cycles involve management of finite resources. These resources are extracted and used in multiple economic cycles through reuse, repair and remanufacturing of the materials and resources. However, the biological cycles are concerned with the management of renewable resources. The biologically – based materials are designed to be restored into the natural systems and regenerated to provide renewable resources (Corporate Finance Institute [CFI], n.d.).

Based on the observation that in the nature the cycles are fueled by solar energy and nothing is wasted but circles in loops, the model of CE decouples economic growth and development from the consumption of finite resources and very often it is identified as circular innovation. The main characteristics of the linear, transition and circular models are given in Table 3.1.

Table 3.1. Main characteristics of linear, transition and circular economies

Linear economy	Transition economy	Circular economy
<ul style="list-style-type: none"> – linear flows (landfill, incineration), – efficiency and waste avoidance, – no-renewable energy 	<ul style="list-style-type: none"> – low-value circular flows (recycling), – mix of renewable and non-renewable energy 	<ul style="list-style-type: none"> – high value circular flows (reuse, cascaded value extraction for organics), – circular business models (sharing, leasing), – renewable energy

Source: Ellen McArthur Foundation (2015, p. 97), after: Raftowiz-Filipkiewicz (2016, p. 108).

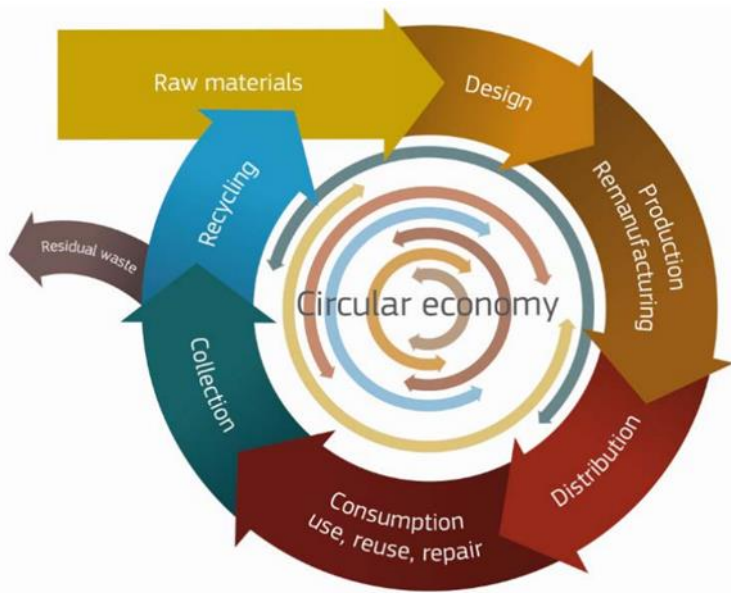
For a successful transition from linear to circular economy the following three requirements will have to be considered at least:

- The disposal sector, as it is established today, will have to rethink itself and move towards a cleaner collection of products. This goes beyond the discussion on mono-material collection. For example, there might be an emerging market for collecting components and reselling them, which is not the standard today.
- Standardization and modularization of components will have to be provided so that a product design which allows easier disassembly will be created.
- Business models will have to be re-innovated. There will be a shift from product ownership to product usage (Technopolis Group, 2016).

One of the main advantages of the circular economy is the possibility of being more sustainable and competitive. According to the research of Ellen MacArthur Foundation (2015b), the main benefit of the implementation of circular economy concept is increasing GDP by 0.8-7%, adding 0.2-3% jobs and reducing carbon emissions by 8-70%. In addition, the analysis of successfully implemented circular economy practices, carried out on a subset of EU manufacturing sectors, has shown that there is great potential for annual net material cost savings ranging from €265 to 490 billion, which equates to up to 23% of these sectors’ current total input costs. The cost savings potential was mostly pronounced in the automotive sector, then in the machinery and equipment sector, and electrical machinery (Ellen MacArthur Foundation, 2012). It was also observed that because

of the healthier, more environmentally friendly and longer-lasting products, the companies that implement the circular business models have reduced liabilities and warranty costs. Herein, it should be emphasized that the implementation of circular business models into practice depends greatly on several factors with the technological and organizational innovation and employment potential of the respective sector (e.g., the recycling sector) being the most important ones (Ellen MacArthur Foundation, 2013). However, the shift towards circular economy is a long-term transformation and requires a lot of reforms which are implicitly included in each phase of the value chain (Figure 3.5), starting from the product's design phase, implementation of circular concepts within the existing business and market models (closed circulation of water, non-waste technology, reducing waste and harmful emissions, use of ecological returnable packaging), through new ways of turning waste into a resource, and ending with the new consumer behavior (extending products life).

Figure 3.5. Main phases of the circular economy model

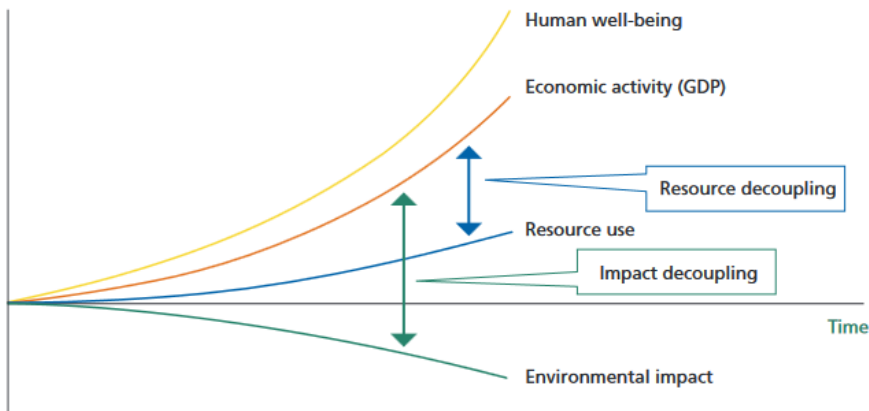


Source: https://eur-lex.europa.eu/resource.html?uri=cellar:50edd1fd-01ec-11e4-831f-01aa75ed71a1.0001.01/DOC_1&format=PDF

The transformation towards a circular economy is a complete systematic change, in technological and organizational terms too. It provides a change of the existing production and consumption patterns by reducing the consumption of natural resources and increasing consumption of recovered and recycled resources,

which consequently should enable resource decoupling (using less resources per unit of economic output) and impact decoupling (reducing the environmental impact of any resource used) and generating wellbeing of future generations, thus contributing to sustainability (Niazi & Anshul, 2015; UN Environment Programme [UNEP], 2011), (Figure 3.6).

Figure 3.6. Decoupling resource and impact decoupling



Source: UNEP (2011).

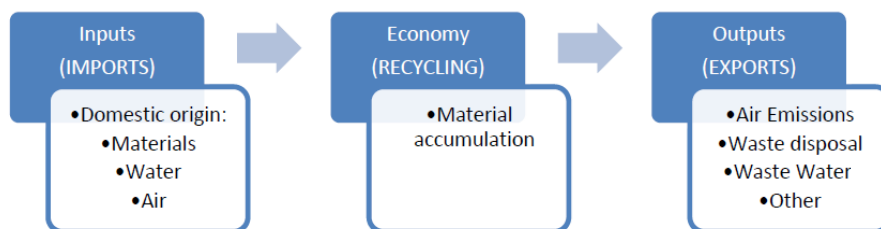
By helping to decouple economic growth from resource use, the transformation to circular economy offers a prospect of sustainable growth that will last. However, most of the reported initiatives on the circular economy up to now are targeted at waste and secondary raw materials and at the abiotic part of the economy, and only few countries (Heshmati, 2015) explicitly have commented that the circular economy requires going beyond increasing recycling rates and a higher use of secondary raw materials by implementing different innovative approaches and initiatives.

Key principles

In the circular economy the products, components and materials are continuously circulating which means that they are reused more times. Thus, their scarcity is decreased and their economic value is increased. According to the European Commission there are four aspects of circular economy: 1) production and consumption, 2) waste management, 3) secondary raw materials and 4) competitiveness and innovation. All these aspects should cover various dimensions at all

stages of the life cycle of resources, products, and services (EC, 2018). As the material flow is in the core of the circularity of economies the overall material flow balance, has to be considered (Figure 3.7).

Figure 3.7. Material flow balance scheme



Source: Sánchez-Ortiz et al. (2020, p. 6).

Based on the material flow balance (Figure 3.7), from a circular point of view the following three principles are crucial (Fogarassy & Finger, 2020):

- principle of inputs,
- principle of sustainable cycles,
- principle of outputs.

The principle of inputs refers to control of resources, balance of the material flow of renewable energy sources and preserving natural resource systems. As far as the technological process is concerned, the materials are continuously circulating in the system without their accumulation. In terms of economic processes, it is ensured that the renewable materials, resources and non-renewable raw materials are always available. In the case of cyclic processes, the circularity is achieved by maintaining the flow of materials, most notably by continuously increasing the proportion of services.

The principle of sustainable cycles refers to closing the processes of the subsystems through loops of different lengths so that a proper functioning of the production systems is ensured. In linear systems there is risk that the resources for the respective production process cannot be always obtained, so the economy may not be able to grow. On the contrary, in circular systems, because of the circulation and possibility of using secondary materials as input in the production processes, the resources are available at high levels of material cycles. The product cyclic processes in circular economy are mainly observed in the technological cycles where different process operations include re-usage of resources, recycling and remanufacturing. In all phases the process is designed so that en-

ergy efficiency is included. As far as biological cycle processes are concerned, the useful biological by-products of the process are released in the environment.

The principle of outputs refers to more efficient allocation and use of existing resources and means of production. It comprises the design and redesign of the equipment, utilization of local resource systems, avoidance of water and noise pollution, as well as usage and generation of toxic substances. As a result, fewer new devices and equipment will be introduced into the production process which will cause less pollution to the environment (Fogarassy & Finger, 2020).

Circular economy business models

There are many circular economy business models and generally they can be categorized into the following three main categories (Sustainable Finance Lab, 2016; Vasiljevic-Shikaleska, Gjozinska, & Stojanovic, 2017a):

- I. *Circular Innovation Models* (CIM) focus on the developing phase. The products are created so that they are easily maintained, repaired, remanufactured or recycled and/or will have a longer lifespan. In the same context, innovative processes are developed to increase the reuse potential and recyclability of industrial and other products, by-products, and waste streams. In this group the models can be classified as (Circular City Funding Guide, n.d.; Het Groene Brein, n.d.; OECD, 2018):
 - Product design model: it provides products with longer lifespan and/or easy for maintaining, repairing, remanufacturing or recycling.
 - Process design model: develops processes that increase the reuse and recyclability potential by products and waste streams.
 - Circular supplies model: provides input materials such as renewable energy, bio-based, less-resource intensive or fully recyclable materials.
- II. *Circular Use Models* (CUM) focus on the usage phase by **optimizing the use** of the product and its added value. These business models enable the service provider to retain ownership of the product and take responsibility during the product's lifetime.

The CUM group consists of the following sub-models:

- Product as a Service model which delivers product performance rather than the product itself through a combination of product and services. The service provider retains the ownership of the product.

- Sell and Buy-Back model where the product is sold on the basis that it will be purchased back after a period of time.
- Sharing Platforms model which enables an increased utilization rate of products by enabling or offering shared use/access/ownership.
- Lifetime Extension model where the useful life of products and components is extended through repair, maintenance, or upgrade.
- Tracing facility model that provides services to facilitate the tracing, the marketing and trade of secondary raw materials.

III. *Circular Output Models (COM)* which focus on the output and provide for **added value after the use phase**. A common feature of the COM models is that the revenue is generated by transforming waste into products or other useful resources.

The COM group consists of the following sub-models:

- Model of recaptured material supplier: Sells recaptured materials and components to be used instead of virgin or recycled material.
- Refurbish and Maintain model: Refurbishes and maintains used products in order to sell them.
- Recycling facility: transforms waste into raw materials.
- Recovery provider: Provides take-back systems and collection service to recover useful resources from disposed products or by-products.
- Support lifecycle: Sells consumables, spare parts and add-ons to support the life cycle of long-lasting products.

It should be emphasized that adoption of one of these circular business models does not necessarily ensure a circular business. A complete circularity can be reached if across the whole supply chain all three models, CIM, CUM and COM, are combined and implemented. Collaboration among the designers and suppliers, as well as service providers and end-of-life companies, must exist so that the water and energy resources and the information and services to be mutually shared are most effectively used. Additionally, if the product is fully designed and produced according to all circular principles but the customer throws it away after use, the outcome is still linear. Hence, a systematic collaboration in all parts of the supply chain is recommended and necessary.

Circular economy indicators

Frameworks and criteria for monitoring the circularity

The efficient implementation of circular economy principles requires suitable tools to support policymakers and decision-makers in setting adequate goals and monitoring the effects of circular economy adoption. The obtained results from the monitoring and evaluation of circular economies should be relevant not just to policy and decision makers, but to all participants, individual companies and industry, society, and the nation as well. Therefore, having a harmonized, measurable, relevant and diagnostic indicators which will meet the needs of all is a necessary prerequisite for successful evaluation of the progress towards circular economy. These indicators should be based on all three perspectives: environmental impact, economic benefit, and resource scarcity (Sánchez-Ortiz et al., 2020). As a measure for circularity, the indicators can be individual variable or a function of several variables expressed as a ratio or index. Furthermore, an indicator may also be a result of a composite information on quantitative and qualitative data as there are cases when none of the indicators alone is capable to monitor the effects from the circularity (Moraga et al., 2019).

There are numerous circular economy frameworks, methodologies and indicators that have been developed recently (EASAC, 2016; Elia, Gnoni, & Tornese, 2017; Ellen MacArthur Foundation, 2015a; Haas, Krausmann, Wiedenhofer, & Heinz, 2015; Jacobi et al., 2018; Moraga et al., 2019; Parchomenko, Nelen, Gillabel, & Rechberger, 2019; Saidani, Yannou, Leroy, Cluzel, & Kendall, 2019). However, regardless the approach used within, all suggested circular economy frameworks, indicators and methodologies are related with the circular economy characteristics and are focused on assessment, improvement, monitoring and communication on the circular economy performance.

The most important criteria that should be considered when performing the CE evaluation are as follows (Saidani et al., 2019):

- level of CE implementation (micro, meso or macro),
- CE loops (maintain/prolong, reuse/remanufacture, recycle),
- performance (intrinsic circularity, consequential circularity),
- perspective of circularity (actual, potential),
- possible uses (information purposes, decision-making purposes, learning),

- degree of transversality (generic, sector-specific),
- dimensionality (a single number, multiple indicators),
- measurability (quantitative, semi-quantitative, qualitative),
- format of the assessment framework (formulas to compute manually, computational tool),
- development background and origins (academics, companies, agencies) (Janik & Ryszko, 2019).

The framework for supporting the measurement of the CE effects, according to Elia et al. (2017) consists of four levels:

- processes to monitor (the material input, the design, the production, the consumption, the end-of-life resource management),
- actions involved (circular product design and production, business models, cascade/reverse cycle skills, cross cycle and cross sector collaboration),
- requirements to be measured (reducing input and use of natural resources, reducing emission levels, reducing valuable materials losses, increasing share of renewable and recyclable resources, increasing the value durability of products),
- implementation levels of the CE (micro, meso or macro level) (Elia et al., 2017).

The CE indicators can be index-based (a single indicator or set of multiple indicators divided in several categories) or physical parameter-based (material flow, energy flow, land use and consumption, and other life cycle based) (Janik & Ryszko, 2019). However, most of the indicators used so far are focused primarily on physical parameters that are more technology related (Vercalsteren, Maarten, & Van Hoof, n.d.). The indicators that focus on socio-institutional aspects are less frequently included in monitoring frameworks.

Generally, circular economy indicators can be divided in three main groups (Janik & Ryszko, 2019; Parchomenko et al., 2019):

- a resource-efficiency cluster, where frequently assessed elements are waste disposal, primary vs. secondary materials, resource productivity and recycling efficiency,
- a materials stocks and flows cluster, related to the destination of flows, waste disposal, stock availability or concentration, downcycling and quality loss, and potential for recycling or remanufacturing,

- a product-centric cluster, where the following elements are considered: the product and the material retention, longevity or residence time.

When designing a system of indicators to evaluate circular economy, different levels must be considered: micro-, meso- and macro-level, and their main characteristics are discussed below.

The *micro level indicators* provide information for specific decision processes of individual companies/businesses, products and consumers, for specific substance or individual products. They support the implementation of policies and decisions in areas such as product policies, energy efficiency, and integrated waste management. These indicators are usually based on the 3Rs principle, but not the CE in general.

The *meso level indicators* consider the material flows within the economy and distinguish the categories of materials, industries or branches of production and categories of consumption. These meso level indicators focus on industrial symbiosis (use of common infrastructures and services) and consumption activities and help to detect waste of materials, pollution sources and opportunities for efficiency gains in specific sectors. They describe the economic, environmental or social performance of a region or an industry.

The *macro level indicators* are designed to evaluate, monitor and improve policies. They are useful for supporting decisions in the field of economics, trade and environmental policy integration, sustainable development strategies, national waste management and resource conservation policies. At this level the main emphasis is on (material) exchanges between the economy and the environment, on international trade and material accumulations in national economies, rather than on flows within the economy.

However, regardless the type of indicator used, in order to have relevant monitoring of the transition from linear to circular economy, the indicators of materials flow and exchange should be observed jointly with the indicators for monitoring environmental impacts (Vercalsteren et al., n.d.).

Most common circular economy indicators

Generally, the circular economy indicators are based on several assumptions (Smol, Kulczycka, & Avdiushchenko, 2017):

- They should be created based on information from existing databases of linear economy indicators.

- They should consider the whole lifecycle of the product/service.
- They should comply with the main EC objectives concerning the circular economy.
- They should create a base for development of final circular economy indicators.

According to Vercalsteren et al. (n.d.) the initial approach to circular economy indicators is based on the existing metrics of:

- Economic output: e.g., GDP¹⁷, the indicator that uses the metrics of GDP provides information about the efficiency and productivity (if GDP is in numerator) or intensity (if GDP is in denominator) of the economy or economic activity sector.
- Per capita figures: the indicator is related to an inhabitant or a household. Per capita figures enable comparison between cities, regions or countries, avoiding the issue of country size and population.
- Input indicators: e.g., RMI¹⁸ and domestic material input, the value of the respective indicator gives information about the materials used for economic activities, including the production for export. They are closely related to the mode of production, the level of foreign trade and level of technology development.
- Output indicators: e.g., DPO¹⁹, the respective indicators describe the material outflows from the production and consumption activities of a given country. The materials that were used in the economy and are leaving it in the form of emissions and waste, or in the form of exports.
- Consumption indicators: e.g., RMC²⁰ and DMC²¹, the respective indicators provide information about the materials consumed by the economic activities. Their values are closely related to the mode of consumption.

¹⁷ GDP – Gross Domestic Product.

¹⁸ RMI – Raw Material Input is the amount of raw materials required to produce the goods which are available for use in production and consumption activities of the economy.

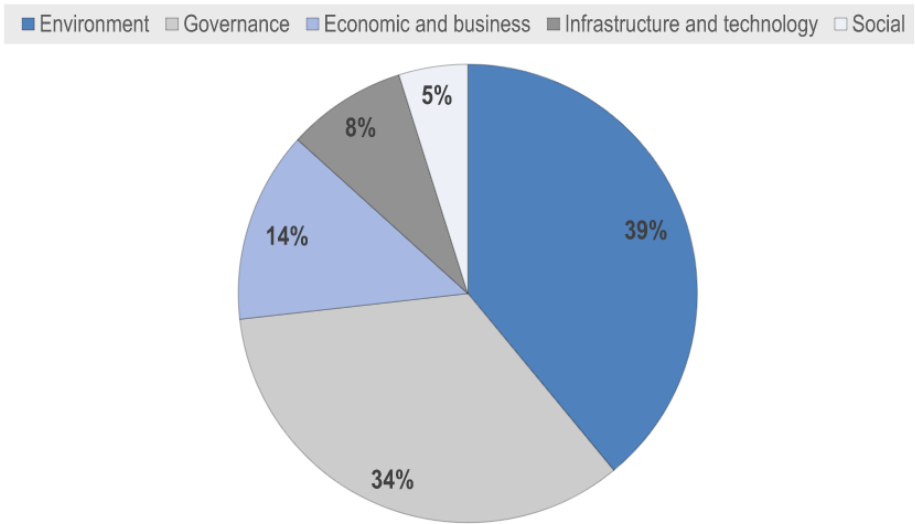
¹⁹ DPO – Domestic Processed Output refers to the total mass of materials which have been used in the national economy, before flowing into the environment. These flows occur at the processing, manufacturing, use, and final disposal stages of the economic production-consumption chain

²⁰ RMC – Raw Material Consumption.

²¹ DMC – Domestic Material Consumption, a measure for the total amount of material directly used by an economy, such as biomass products, metal ores, fossil fuels, non-metallic minerals, petroleum resources, etc.

The OECD Inventory of Circular Economy Indicators has collected more than 400 circular-economy-related indicators and they are classified in five groups: Environment, Governance, Economics and business, Infrastructure and technology and Social indicators (Figure 3.8) and their short description is given below.

Figure 3.8. Categories of circular economy indicators



Note: The graph refers to the 474 indicators belonging to 1 of the 5 categories.

Source: OECD (n.d., Figure 5.2).

Environment (39%): The indicators belonging to this group are directly connected with the ecosystem, such as emissions, output material process and production and consumption.

Governance (34%): These indicators are mostly related to education, capacity building and regulation.

Economics and business (14%): This group includes indicators expressed in monetary units such as the value-added of the circular economy and the public investment in circular economy projects, as well as indicators focused on activities performed by and within companies.

Infrastructure and technology (8%): These indicators measure the existence of tools, technologies and spaces that boost the circular economy.

Jobs (5%): The indicators in this group are closely associated with employment and human resources (OECD, n.d.).

Further on, the collected OECD indicators are classified in 33 sub-categories and 11 sectors (OECD, n.d.).

As the resource efficiency, material flows and waste reduction are central in the circular economy, in the following subchapters the focus will be put on Material Flow Analysis (MFA) and resource (eco) – efficiency indicators. Material flows present the amounts of materials in physical weight (excluding water and air) that are available to an economy. These material flows comprise the extraction of materials inside the economy and the physical imports and exports (i.e., the mass weight of goods imported or exported). Air and water are generally excluded.

a) Raw material consumption (RMC)

The RMC, also known as “material footprint” (Eurostat, n.d.-b) is a macro-economic consumption-based indicator that measures physical quantity of materials required along the supply chains of all goods and services finally consumed in a country – the so-called raw material equivalents (RME)²². The RMC is calculated as the sum of domestic extraction (DE)²³ and the imports measured in RME²⁴ minus the exports in RME²⁵ as follows:

$$RMC = DE + imports\ in\ RME - exports\ in\ RME \quad (1)$$

As a whole, RMC provides more comprehensive information of the nation’s material consumption (Eurostat, n.d.-ab).

In a successful CE the RMC decreases. The lower value of the RMC means that more materials are circulating which on the other hand reduces raw material consumption, saves costs and optimizes the environmental pollution.

b) Resource productivity

The *resource productivity* is noted as a leading macro-indicator (Frone & Frone, 2015) for measuring the main EU objective of improving economic performance while reducing pressure on natural resources (Eurostat, 2018b; Melece, 2016;

²² RME refers to raw material equivalents and defines the amounts of raw materials required to provide respective traded goods. Especially for finished and semi-finished products, imports and exports in RME are much higher than their corresponding physical weight.

²³ DE is domestic extraction and presents the amount of raw material (excluding water and air), in physical weight, extracted from the natural environment for use in the economy.

²⁴ Imports in RME, are the amount of raw material required to produce the goods imported into the economy.

²⁵ Exports in RME, are the amount of raw material required to produce the goods exported from the economy.

Smol et al., 2017). It is a policy indicator which relates the GDP to the main material flow indicator Domestic Material Consumption (DMC) (equation 2) and measures the total amount of material directly used in the economy, by businesses, government or by households (Eurostat, n.d.-c; Vasiljevic-Shikaleska, Gjozinska & Stojanovic, 2017b).

$$\text{Resource productivity} = \frac{GDP}{DMC} \quad (2)$$

As far as circularity is concerned a higher resource productivity ratio would indicate better performance, with growth consuming relatively fewer resources, i.e., greater output or value added per unit input of resources. By improving the resource productivity, the environmental constraints might be reduced and greater welfare delivered, especially in the countries where natural resources and materials play a strategic role in the economic structure.

c) *Waste generation*

In order to shift towards circular economy many countries have included the issue of efficient management of natural resources in their respective national strategies documents and have launched initiatives to promote waste prevention and policies for sustainable materials management. The most frequently proposed and used waste management indicators, within the EU and national strategies and action plans, are the *waste generated per capita*, the *waste intensity* and the *recycling rate of the municipal waste* (EASAC, 2016; Eurostat, 2021b; Melece, 2016; Smol et al., 2017; Vassilis, Rojas-Solórzano, Kim, Aitbekova, & Ismailova, 2015).

The *waste generation* is closely related to the growth in production and consumption. It is generally a macro-economic indicator, but can be also scaled down to municipal waste, waste generation by economic activity, company-level, waste stream (e.g., food waste), etc. By reducing the waste generation in absolute terms, decoupling of the economic growth from resource use will be enabled. However, as in the EU CE Action Plan the waste is considered as a resource, the waste management plays a central role in the circular economy (Vercalsteren, n.d.).

The waste generation is used not only as indicator by itself, but also as input for calculating the *waste intensity* as follows:

$$\text{Waste intensity} = \frac{\text{Total waste generated}}{GDP} \quad (3)$$

The values of the waste intensity enable assessment of the effectiveness of a certain environmental policy (Vassilis et al., 2015) and provide information if decoupling between the waste generation and economic growth exists.

d) Recycling rate

The *recycling rate*, commonly used for evaluating the waste management process, on one hand, and the development of a sustainable method for recycling and obtaining secondary raw materials and/or energy/heat by using its calorific value of the waste, on the other, is of crucial importance when circularity is concerned.

Recycling of waste is defined as any recovery operation by which waste materials are reprocessed into products, material or substances whether for the original or other purposes. The recycling rates are meso-economic indicators, but can be also scaled down to recycling of municipal waste²⁶ and recycling of specific waste stream²⁷.

e) Circular material use rate (CMU)

The circular material use rate, also known as circularity rate, measures the share of material recovered and fed back into the economy. Thus, extraction of primary raw materials in overall material use is reduced. The indicator includes flows of materials but it does not include flows of water. It includes flows of fossil fuels and energy products (Eurostat, 2018a).

CMU is defined as the ratio of the circular use of materials to the overall material use, where overall material use is a sum of the aggregate domestic material consumption and the circular use of materials (equation 4) (Eurostat, n.d.-a)

$$CMU = \frac{U}{M} \quad (4)$$

$$M = DMC + U \quad (5)$$

where are:

U – circular use of materials,

M – overall material use.

²⁶ Municipal waste consists of waste generated by households and similar wastes from sources such as commerce, offices and public institutions.

²⁷ Specific waste stream includes waste from overall packaging, plastic packaging, wood packaging, WEEE, bio-waste, construction and demolition.

The circular use of materials, U, is defined as the flow of materials that had become waste, but which after recovery were fed back into the economy and used for production and/or consumption purposes, thus saving on the use of primary raw materials. A higher value of CMU indicates that more secondary materials substitute for primary raw materials thus reducing the environmental impacts of extracting primary material.

The CMU links material use and waste management, allowing for an integrated approach to the related issues.

The CMU is an indicator at macrolevel, but besides for the whole economy, the input of primary materials versus secondary materials per industry is a possible derivate of CMU at meso-level.

f) Composite indicator of circularity

However, all indicators related to materials (some of them mentioned in the text above) should not be observed in isolation from the other key indicators which reflect the non-linear behavior of the economy but should be combined in such a way that would reflect the circularity clearly. It may be achieved by using an expression that would include positive evolution indicators at the nominator (a positive circularity trend if they increase) and negative evolution indicators at the denominator (a positive circularity trend if they decrease).

One possible aggregated combination of several key linear economy indicators, proposed by EASAC (2016), integrates the energy productivity, GDP per capita, rate of recycling and carbon dioxide emissions according to the equation (6) (EASAC, 2016):

$$\text{Composite indicator of circularity} = \frac{GDP}{TPES} \frac{GDP}{population} \frac{Recycle\ rate}{CO_2\ emission} \quad (6)$$

where:

TPES refers to total primary energy supply.

The ratio GDP/TPES determines the energy productivity.

As it can be seen from equation (6) the values of the proposed composite indicator of circularity would increase if the energy productivity, GDP per capita and recycling rate increase and the carbon dioxide emissions decrease. Hence, higher values of this composite indicator would mean higher energy and materials efficiency with lower CO₂ emissions, and would imply a more efficient transition towards circular economy.

g) Material circularity indicator

The material circularity index, MCI, is a microlevel indicator related to the restoration of material flows at product and company level. It is focused on technical cycles, where products and materials are kept in the market as long as possible by repairing, reusing, remanufacturing and recycling. Throughout the whole cycle the quality of materials is maintained at the highest level. The values of MCI vary between 0 and 1, where 1 refers to fully circular process, 0.1 refers to a linear process, and a value below 0.1 implies a linear product with utility lower than the average one (Thinkstep, n.d.).

KEY TERMS

Circular economy, 3R principles, resource use, resource decoupling, circular economy business models, indicators.

SUBCHAPTER SUMMARY

The circular economy is an alternative economic model for exchange and production that seeks to decouple economic growth from material dependency. It is a sustainable development strategy that is being proposed to tackle the problems of environmental degradation and weaken the dependence of economy on natural resources and environment. Through embedding the 3R principles of materials use – Reduce, Reuse and Recycling – into production and consumption process, the Circular Economy aims at greater resource productivity, higher energy savings and lower greenhouse gasses emission.

A variety of approaches that encourage the transition to a circular economy exist, and generally they are categorized in three main groups: Circular Innovation Models, Circular Use models and Circular Output Models. However, adoption of only one of the circular business models does not necessarily ensure a circular business. In order to achieve circularity, these models have to be implemented jointly across the supply chain. Collaboration among the designers, the suppliers, the service providers and end-of-life companies must exist so that information about the material and energy resources is shared. The transition to circularity involves a complete systematic change comprising innovation in technological and organizational terms too. By helping to decouple economic growth from

resource use the transformation to circular economy offers a prospect of sustainable growth that will last.

Having a harmonized, measurable, relevant and diagnostic indicators which will meet the needs of all is a necessary prerequisite for successful evaluation of the progress towards circular economy. The circular economy indicators used for evaluation of the transition to circular economy are developed in three different levels: micro-, meso- and macro-level and are based on several metrics: economic output, per capita figures, as input and output indicators or as consumption indicators. As the resource efficiency, material flows and waste reduction are central in the circular economy, the focus within this Subchapter is put on the material flow analysis and resource efficiency indicators.

DISCUSSION QUESTIONS

1. What are the most important components of circular economy?
2. What are your favorite examples of circularity in action?
3. Will moving toward circular economy require changes in consumer behavior?
4. How can Life Cycle Analysis (LCA) support circular economy?
5. Have any consumer-products companies in your city/country begun to make this shift? What kind of activities did they have to undertake to get started?
6. Does a company that decides to go in this direction require new staff positions or new kind of managers?
7. Green business and circular business models: in what way do they differ from linear business models and how do they work?
8. For businesses, green is good! Agree/disagree? Why?

TEACHING METHOD/TECHNIQUE

- face-to-face lectures,
- distance/online learning,
- exercises,
- case studies,

- problem based learning,
- buzz groups / cross-overs / role play,
- individual assignments.

Students will engage in active student-centered learning, before, during, and after class sessions. They will have the possibility to conduct both desk/empirical research to devise feasible strategies, ideas and solutions. The lecturer's role will be to deliver the course to the students and to guide them through the process of exploration, elaboration, and learning.

The students will work on projects in groups (Buzz groups / Cross-overs), and depending on their preferences, they will have the possibility also to prepare individual project as well. Role play as a teaching method will be also used.

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3.2. Waste management

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LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- recognize the added value of particular waste streams,
- analyze and describe the potential of solid waste as a secondary raw material,
- understand the challenges of solid waste management,
- suggest and implement waste management practices in order to divert solid waste from going to a waste disposal facility,
- describe various waste disposal techniques/designs and monitoring,
- suggest a way to tackle particular problem from a system analysis approach if a case related with a solid waste problem is given,
- recognize different models for waste optimization,
- independently search for relevant information connected to solid waste management issues, analyze it and deliver it in a form of written report.

Introduction

The material resources are of particular importance for the economy. They form the physical foundation of the economy and are significant source of income and jobs. Knowing that economic growth is closely related to the growing demand on raw materials, energy and other natural resources, it is very important to enhance the *resource efficiency* and *productivity* of the material resources since there is a great amount of material that ends up as waste if it is not managed properly (OECD, 2020). However, the waste generation is a natural product of industrialization, urbanization, economic development and population growth. Most of human's needs are met by producing and using large amounts of different products which, after use, become waste (Eres, 2019). Consequently, as societies become more populated and prosperous, there is increased offer of prod-

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ucts and services and a constant consumption growth which leads to generation of large amounts of waste to be managed through treatment and disposal (Kaza, Yao, Bhada-Tata, & Van Woerden, 2018).

The waste, as a material, is part of the economy – it is a **by-product (output)** of the activities performed by the industry, businesses, government and households. The waste also can be viewed as **input** or some economic activities, whether through material or energy recovery. Therefore, the waste management has economic implications for the productivity, government expenditure and the environment as well (INTOSAI, n.d.-a).

According to Shukla, Ganguly, and Hussain (2020) as a result of the “shift in economy with the goal of industrialization, the number of industries, particularly those which produce hazardous wastes, has increased dramatically”. If the waste is not treated properly, it can cause many adverse effects on the environment like air, ground, water and ocean pollution, as well as greenhouse gas emissions which on the other hand is contributing to a climate change. Hence, the waste generation is considered as one of the biggest environmental problems.

The statistics show that in 2018 in the EU-27 over 2.3 billion tonnes of waste, arising from all economic activities and households, were generated (Eurostat, 2018). Eurostat statistics have also shown that most of the waste was generated in Denmark, Luxembourg, Malta, Cyprus, and Germany with over 600 kg per person annually (Eurostat, 2021). Denmark produced the highest amounts of municipal waste per capita in the European Union, with an average of 844 kilograms of waste per inhabitant in 2019. Luxembourg and Malta follow after Denmark.

On a global level OECD predicted that the waste production by 2020 will be increased by more than 45% compared to 1995 (European Environment Agency, n.d.) whereas the World Bank (Kaza et al. , 2018) has reported that based on the available data “the global waste generation in 2016 was estimated to have reached 2.01 billion tonnes”. According to their estimation, most of the waste is generated in the countries of East Asia and Pacific, around 468 million tonnes which accounts for 23% of the waste generated globally, the European and Central Asia countries follow with 392 million tonnes generated waste in 2016 (20%) and South Asia with 334 million tonnes or 17% of the waste generated globally. The lowest amount of waste is generated in the countries of the Middle East, about 6% of the world’s waste by magnitude (Figure 3.9).

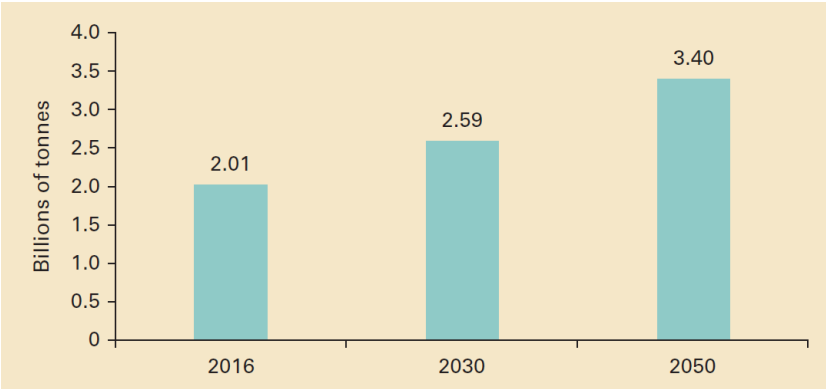
Figure 3.9. Estimated amounts of waste generated by region, in 2016



Source: Kaza, Yao, Bhada-Tata, & Van Woerden (2018).

In the same report for solid waste management (Kaza et al., 2018) based on the developed projections for global waste generation, it is reported that “by 2030, the world is expected to generate 2.59 billion tonnes of waste annually”, whereas “by 2050, waste generation across the world is expected to reach 3.40 billion tonnes” (Figure 3.10).

Figure 3.10. Projected global waste generation



Source: Kaza et al. (2018).

Most of the developed countries that developed environmentally in the past period, today are effectively addressing much of the health and environmental pollution issues associated with wastes generation. However, in emerging countries, the increasing rate of urbanization and development is now leading to a repeat of the same problems that developed countries have had concerning the waste generation issues (Wilson, 2007).

In recent times, the rate and quantity of waste generation is increasing. As the volume of wastes increases, the variety of the waste increases too. (Vergara & Tchobanoglous, 2012).

According to the European Commission [EC] (2005) the waste is a complex material which is difficult to grasp, regulate and manage. It has strong influence on the businesses, public authorities, different commercial organizations, citizens and the overall society. Hence, decreasing the amount of the new waste and safe and efficient management of the existing waste must be seen as the priority in society's environmental policies.

Although, in general, the waste is seen as unwanted material generated in any production and usage process (Shukla et al., 2020) and something that is no longer needed, still as mentioned previously, it includes materials that can be furthermore utilized by recycling, reprocessing or reusing. The previous one especially refers to the materials remaining from the raw materials, semi-finished products and products in the industrial production processes. Hence, if managed properly, the waste should be considered as a valuable raw material and as energy generating product which can bring utility and profit. (Eres, 2019).

Over the last decade there have been many attempts to deal with waste management problems and find the most practical solution. However, the procedure becomes very complex because there is variety of mutually conflicting factors that influence the waste management process.

The main goal of any waste management policy is to minimize the negative effects of waste on human health and the environment by obeying the five-step waste management hierarchy (OECD, 2020; EC, 2005) where prevention of waste generation is the most preferred option, followed by re-use, recycling and other forms of recovery (including energy recovery through incineration and composting) with disposal to landfill being the least desirable waste management option. It is therefore necessary to:

- clarify the key concepts of waste and waste management,
- highlight the environmental relevance of the waste,

- promote a waste management system that moves up the waste management hierarchy,
- utilize an approach that considers the whole life-cycle of products and materials,
- focus on strengthening the economic – so-called added value – of the waste.

It was shown that in practice many waste management projects take from five to ten years to implement (United States Environmental Protection Agency [EPA], 1995).

The aim of this Subchapter is to make a review of the waste types and waste classification, as well as to provide insight into the waste management practices implemented by the European Union along with reviewing some of the approaches used for optimizing the waste management systems.

Definition and classification of waste

Definition of waste

A notable variety of definitions for waste are used globally and only a few of them are given in the text below.

According to EHS²⁸ Guidelines “a waste is any solid, liquid, or contained gaseous material that is being discarded by disposal, recycling, burning or incineration. It can be by-product of a manufacturing process or an obsolete commercial product that can no longer be used for intended purpose and requires disposal.” (International Finance Corporation [IFC], 2007).

By the definition included in the first Framework Directive on Waste 75/442/EC, waste is “any substance or object or, more generally, any movable good that the holder has discarded, intends to discard or must discard” (EUR-Lex, n.d.-e).

The **Basel Convention** states that “Wastes are substances or objects which are disposed of or are required to be disposed by the provisions of national law” (UNEP, n.d.). **The definition given by OECD** states that “Wastes are substances or objects, other than radioactive materials covered by other international agreements, which: a) are disposed of or are being recovered; or b) are intended to be disposed of or recovered; or c) are required, by the provisions of national law, to be disposed of or recovered.” (OECD, 2021).

²⁸ Environmental, Health, and Safety.

According to the United Nations Statistics Division “Wastes are materials that are not prime products (that is products produced for the market) for which the generator has no further use in terms of his/her own purposes of production, transformation or consumption, and of which he/she wants to dispose” (UN Statistics Division [UNSD], 2011).

Zero Waste America defines waste as “A resource that is not safely recycled back into the environment or the marketplace” (Zero Waste America, n.d.).

Regardless the above definitions, whether or not a substance is discarded as waste and when waste ceases to be waste, are matters that must be determined on a case-by-case basis (EDF, n.d.). It is so because the term “waste” might be subjective (what is waste to one need not necessarily has to be waste to another) and sometimes objectively inaccurate (e.g., if scrap metals are classified as waste and landfilled it would be inaccurate classification as they are recyclable) (Godswill & Somtochukwu, 2017).

As far as the waste management is concerned, the legislation at European level, with regard to the basic requirements and principles, is comprehended in Waste Framework Directive 2008/98/EC that repeals the previous ones: Directive on Waste 2006/12/EC, Directive on hazardous waste 91/689/EC and Directive on Waste Oils 75/439/EC.

Classification of waste

The waste can be classified based on many criteria with respect to the *source* (who generated it?), *substance* (what is its composition?), *hazard properties* (is it dangerous or not?), *management* (who handles it?) or a mix of these concepts (INTOSAI, n.d.-a).

The most common waste classification is according to its environmental impact, where the waste is classified in two main groups as hazardous and non-hazardous waste (EDF, n.d.; Eurostat, 2013; Environment Agency, n.d.).

Figure 3.11. Classification of waste according to its environmental impact



Source: Authors’ own elaboration based on: National Audit Office of Estonia, after: INTOSAI. (n.d.-c); INTOSAI (n.d.-d, Figure 2).

The hazardous waste is the waste that may contain toxic substances arising from a wide range of different sources like medicine, industry, commercial activities and households. It includes the medical and nuclear waste, waste from electric and electronic waste, paints, solvents, oils, pesticides and other kind of materials that can be harmful for the environment and humans and therefore have to be specially treated before disposing. The hazardous waste can be corrosive, inflammable, explosive or can react when exposed to other materials (Saleh, 2016). Some hazardous materials are highly toxic to environment and can harm humans, animals and plants.

The management of hazardous waste is very complex and presents a specialized discipline that deals with special techniques for handling the waste so as to minimize its harmful effects on humans and environment. The possible ways of treating the hazardous waste involve chemical treatment, incineration or high-temperature treatment, as well as its safe storage, recovery and recycling. Most hazardous waste originates from industrial production (INTOSAI, n.d.-a).

In recent years, under the term “hazardous waste” the radioactive waste is included as well. It is defined as the material that contains or is contaminated with radioactive isotopes in amounts recognized by regulatory authorities as posing a potential risk to human health and the environment. The hazard of radioactive waste depends on the nature and concentration of the radioactive isotopes. The

radioactive waste is managed differently from the other types of waste. Based on the data of recent studies with respect to the public health implications of the radioactive waste, the experience of industrialized nations has indicated that current efforts to manage hazardous waste are not sufficient (Belien, Boeck, & Ackere, 2011; De Rosa et al., 2017).

The non-hazardous waste, by definition, is the waste that does not have any significant hazardous properties although it could have negative influence on environment and human's health if it is not managed properly. This waste category represents approximately 14% of all waste generated (World Bank, 2012) and includes waste from households and commercial waste, agricultural and biodegradable municipal waste, plastic waste from food packaging, glass, metal and beverage cans, paper, biomass, etc.

The waste that has no hazardous properties and does not undergo any significant physical, chemical or biological transformations when disposed of is *inert waste*. This kind of waste does not dissolve, burn or react chemically and physically in a way that could harm the environment and the human health. Examples of inert waste are the concrete, glass, sand and construction and demolition waste (EDF, n.d.).

The waste classification can be also based on its origin when several types of waste are recognized (Amasuomo & Baird, 2016):

- municipal solid waste,
- industrial waste,
- waste from construction and demolition,
- waste from mining,
- waste from plastic packaging,
- waste from electrical and electronic equipment (WEEE),
- agricultural waste,
- biodegradable waste,
- end of life vehicles and tyres.

The municipal solid waste (MSW) is one of the most studied waste streams. It is generated in private households, and in smaller quantities from businesses, small industries and commercial activities. It is the waste from the everyday items which are commonly thrown away after their usage (packaging from different

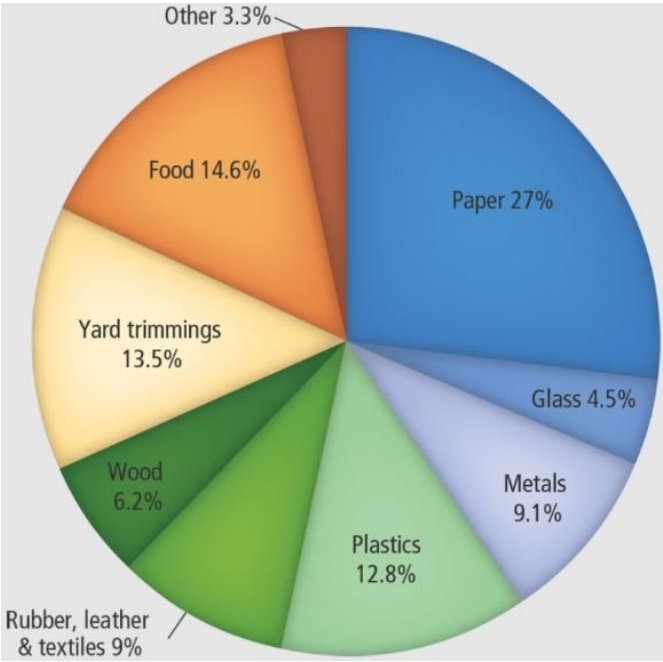
products, furniture, food scraps, cloth, home appliances, paper, batteries, etc.) (Danbuzu, Tanko, Inrahim, & Ahmed, 2014).

The definition of the MSW, according to the European Union, states that it is the “waste from households, as well as any other waste which, because of its nature or composition is similar to waste from households” (EUR-Lex, n.d.-a). Additionally, the MSW streams include the waste from commercial activities as long as it has similar composition to the household waste.

The composition of the MSW includes materials such as soil, garden and food waste, wood, paper, ashes, plastics, textiles, and glass. It is influenced by many factors, such as lifestyle, economic situation, waste management regulations and industrial structure.

Most of the studies conducted so far have shown that in general, the largest fraction of the municipal solid waste consists of paper (27%) while the plastics comprise about 13% of the total MSW (Figure 3.12).

Figure 3.12. Composition of municipal solid waste



Source: EPA’s Web Achiwe (n.d., Figure 4).

Research has also shown that as the countries urbanize and populations become wealthier, consumption of materials with long times of degradation (plastics, paper, glass, and aluminum) increases, and it mostly concerns the waste stream of middle- and high-income countries.

For a more clear view of the MSW composition and its connection with the times of degradation of the respective materials, in Table 3.2 the approximate times of degradation of the most frequently generated municipal solid wastes are listed (World Bank, 2012). It can be observed that materials like plastics, metals and glass have very long time of degradation which can have negative repercussions on the environment, and economics as well, if they are not recycled, reused or recovered.

The *plastic packaging waste*, within MSW, is regulated by the Directive 94/62/EC on packaging and packaging waste (EUR-Lex, n.d.-d). It has a short usage life but undefined time of degradation and as such presents a huge managing problem if it is disposed.

Table 3.2. Types of waste and the approximate time it takes to degrade

Waste type	Essential time for waste degradation
Organic waste (vegetable and fruit peels)	7-14 days
Paper	10-30 days
Cotton cloth	2-5 months
Wood	10-15 years
Woollen items	1 year
Tin, aluminum and other metal items	100-500 years
Plastic waste	One million years???
Glass bottles	Not determined

Source: Based on: Edu Green (n.d.); *Waste Advantage Magazine* (2017, June 15).

The *recyclable waste category*, consisting of plastic packaging and waste from electrical and electronic equipment, is about 17% and 4% of the total volume of MSW, respectively.

However, the presence of fractions, like the organic waste, paper, cotton cloth and wood, adds value to MSW because these fractions can be easily recovered into energy using incineration or composting (Amasuomo & Baird, 2016). Therefore, greater attention has to be paid to these fractions, as well.

There are many factors that affect the generation of MSW. The most important among them are the population growth, rate of urbanization, economic development and the degree of industrialization.

With the increase of the rate of urbanization, the amount of the MSW is growing even faster than the rate of urbanization (World Bank, 2012). Currently about 56.2% of the global population lives in cities (World Economic Forum, n.d.) and urban areas and the World Bank has estimated that the number of urban residents will increase from 3 billion in 2012 to 4.3 billion in 2025, whereas the waste generated is expected to increase from 1.3 billion tonnes to 2.2 billion tonnes, respectively.

On the basis of available data from previous years, estimates of the waste generation for the year 2025, depending on the population growth, are given in Table 3.3. It can be seen that when the urban population increases by approximately 1.4 times the generated waste is increased by more than 1.7 times.

Table 3.3. Waste generation projections for 2025 by region

Region	Current available data			Projections for 2025			
	Total urban population (millions)	Urban waste generation		Projected population		Projected urban waste	
		Per capita (kg/capita/day)	Total (tons/day)	Total urban population (millions)	Urban population (millions)	Per capita (kg/capita/day)	Total (tons/day)
AFR	260	0.65	169 119	1 152	518	0.85	441 840
EAP	777	0.95	738 958	2 124	1 229	1.5	1 865 379
ECA	227	1.1	254 389	339	239	1.5	354 810
LCR	399	1.1	437 545	681	466	1.6	728 392
MENA	162	1.1	173 545	379	257	1.43	369 320
OECD	729	2.2	1 566 286	1 031	842	2.1	1 742 417
SAR	426	0.45	192 410	1 938	734	0.77	567 545
Total	2980	1.2	3 532 252	7 644	4 285	1.4	6 069 703

Note: AFR – Africa region, EAP – East Asia and Pacific, ECA – Europe and Central Asia region, LCR – Latin America and Caribbean region, MENA – Middle East and North Africa region, OECD – Organisation for Economic Co-operation and Development, SAR – South Asia region.

Source: World Bank (2012).

Regarding the influence of the economic development and the degree of industrialization, in general, the higher economic development and rate of urbanization reflects in generation of larger amounts of waste. A high correlation between the income level and urbanization exists. Namely, if the disposable incomes and

living standards increase then the consumption of goods and services will increase as well. Consequently, greater amount of waste will be generated. It is noted that “Urban residents produce about twice as much waste as their rural counterparts” (Oncioiu, 2018).

Industrial waste “is the waste produced by industrial activity which includes any material that is rendered useless during a manufacturing process such as that of factories, industries, mills, and mining operations” (Godswill & Somtochukwu, 2017). The industrial waste can be solid, gas, or liquid and each category has different methods of management and disposal. The waste generated from industrial sources contains non-hazardous and hazardous components; with the non-hazardous components being a larger part of the total waste volume. Some examples of industrial waste are chemical solvents, paints, sandpaper, paper products, industrial by-products, metals, and radioactive wastes (Godswill & Somtochukwu, 2017; Godswill, Twinomuhwezi, Gospel, Somtochukwu, & Otuosorochi, 2020).

Waste from Electrical and Electronic Equipment (WEEE) arises from all kinds of electrical and electronic equipment, IT and telecommunication, refrigerators, washing machines and televisions. E-waste is generally classified as hazardous because it contains potentially toxic components which can be harmful to human health and the environment. For that purpose, the European Commission has prepared regulative for WEEE in the form of two Directives: the Directive 2002/95/EC (EUR-Lex, n.d.-b) is for restricted use of certain hazardous substances in EE equipment and the Directive 2002/96/EC (EUR-Lex, n.d.-c) was developed to specify collection and recycling of such equipment.

End of Life Vehicles (ELVs) and Tyres present another important waste category. Although most of the composing materials of the vehicles (aluminum, steel and plastics) can be recycled it must be done very carefully as the presence of lead, mercury, cadmium, hexavalent chromium, antifreeze and different kind of oils can be harmful for the humans and environment.

The *waste from construction and demolition* is generated mostly from the construction industry and road infrastructure renovation and maintenance. It is usually made up of concrete, sand, wood, glass, plastics, asbestos, solvents and paints and must be managed with great attention.

The *agricultural waste* is composed of waste from animal farms and agriculture. It includes animal manure, various crop residues and silage effluent; it is organic and biodegradable. The agricultural waste is mostly reusable in the energy and

industrial sector. However, the presence of small amounts of plastics, pesticides, waste oils and veterinary medicines may pose a risk to the environment.

Waste management

Waste management is much more than collecting waste. It is the collection, transport, processing, recycling, disposal and monitoring of waste by considering the environmental, economic, technical, legislative and institutional issues (Belien et al., 2011).

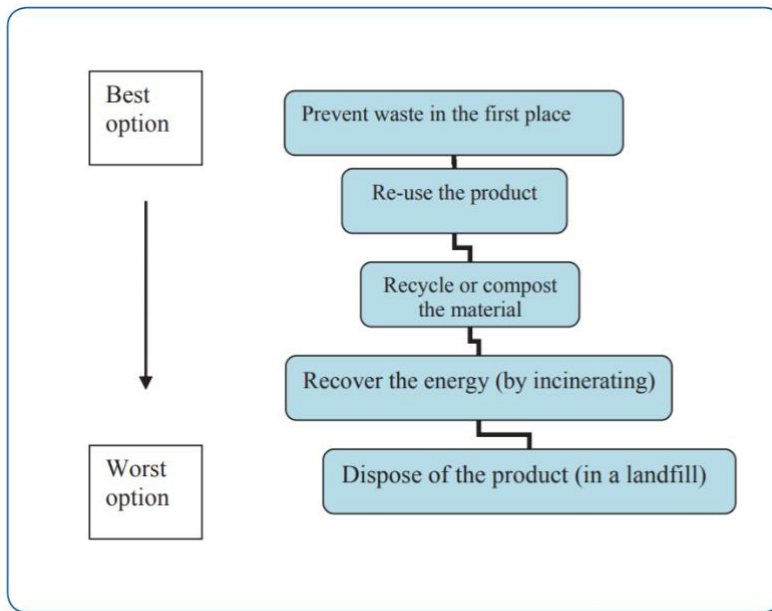
A variety of different alternatives for treating and managing waste exist. According to the waste hierarchy (Figure 3.13) they involve prevention and minimization, re-using, recycling (including composting), then energy recovery and disposal through landfills as the least preferred option. Following the EU policy, in the case when waste generation cannot be prevented the opportunities for its re-use, recycling and recovery should be comprehensively investigated before its disposal. In the following section a brief explanation of each stadium of the waste management hierarchy is given.

Waste management hierarchy

Prevention, along with minimization, is the most favorable waste management practice because it aims at elimination or reducing the generation of waste which is reflected in avoidance of all the other waste management steps.

As far as the *re-use* of waste is concerned, the initially used product can be utilized once or more times for the same or other purposes without reprocessing (second-hand clothes, donating used household items, books and magazines, using empty food containers to store leftovers, etc.). In that way, the resources like virgin materials and energy that would be consumed for the manufacturing of the completely new product will be preserved. Prolonging product's and material's lifetime and thus preventing them from becoming waste as long as possible, as well as using waste as a renewable resource, are crucial for achieving "green" economy. It will result in reducing greenhouse gas emissions and reducing EU dependency on imported materials. Also, positions for green jobs will be created and "green" growth will be fostered (EC, n.d.).

Figure 3.13. Waste management hierarchy



Source: EC (2005).

Recycling is an effective way to manage the waste material once it has been generated and cannot be used furthermore in its original form. It can considerably contribute to reducing the waste generation, after the prevention and reuse steps. The recycling consists of collecting, processing or remanufacturing the waste materials destined for disposal. Collection of recyclables can be achieved in several ways:

- by drop-off,
- by buy-back and/or
- by curbside collection.

The drop-off and buy-back collection require delivery of the solid waste by citizens to a drop-off site where a recycling center or a buy-back center is established, while the curbside option means that the solid waste is placed in a solid waste container at a curb and collected by the local authority collection center. Afterwards, the recyclables are delivered to a processing facility, where, using the baling technique, they are temporarily stored for either incineration or recovery of raw materials. The advantage of this management option is that utilization of virgin materials is decreased, and landfilling is prevented (Al-Salem, Lettieri, & Baeyens, 2009).

Composting as a waste management option, is an integral part of the total management of the solid waste stream. As municipal solid waste contains up to 70% organic materials, composting can greatly reduce the amount of waste that ends up in landfills or incinerators. It is a process of controlled, anaerobic or aerobic, decomposition of organic materials, such as leaves, grass and food scraps by microorganisms resulting in a soil-like material, known as compost. The compost is good soil conditioner and can be used as organic fertilizer in landscape applications to improve crop production and to control erosion. Due to the high content of organic matter, the compost enables the soil to increase the water holding capacity, decreasing in that way the necessity for frequent watering. Also, the balanced microbial communities found in compost enhance plants growth and their resistance to disease which results in avoidance of the use of fungicides. The compost is effective at limiting erosion as well.

After reducing the waste and implementing the re-use and recycle steps of the waste management hierarchy (including composting) as much as possible, the remaining waste fractions can be used to generate heat and power, a step commonly known as *recovery*. In that direction, there are various treatments that can be used for recovering the waste and obtaining different types of energy from biogas to electricity. The combustion of waste at high temperatures, known as waste-to-energy incineration can generate energy while reducing the amount of waste by up to 90% in volume and 75% in weight.

By recovering the energy from leftover fractions, the most wanted option to send zero waste to landfill is enabled which may bring added value to local communities and the broader economy.

Landfilling is defined as disposal of waste that cannot be reduced, recycled, composted or incinerated. In a municipal solid landfill the waste is enclosed by cover material at the top and by a liner system at the bottom. In order to control the infiltration of water, gas emission to the atmosphere, and erosion, but also to protect the waste from long-term contact with the environment the cover material consisted of layers of soil and geosynthetic materials. The role of the liner, usually multilayered clay and geosynthetic materials, is to collect leachate and reduce or prevent contaminant flow to groundwater.

A properly structured MSW landfill should inevitably involve a leachate collection system and a gas control and recovery system (EPA, n.d.)

If waste materials are generated, even after undertaking all necessary steps in the waste management hierarchy, starting from waste prevention and reduction, reusing,

recycling and recovery, then they need to be disposed of by taking all measures for avoiding the potential harmful impact on human's health and the environment as well (IFC, 2007).

Industrial waste management

The smog alerts in many urban cities result not only from harmful emissions of vehicle transportation but also from the industry outputs. Therefore, the industrial waste management is a very important issue from environmental point of view. It is common that in order to manufacture different kind of goods a lot of valuable inputs in terms of energy and materials are needed; and the resulting industrial waste in many cases is very difficult to be managed.

Hence, many countries, governments and local authorities have created specific laws that oblige the industry to take responsibility for the waste that pollutes the air, soil and water. Additionally, in order to offset the environment damage extra taxes have been set up for the industries that produce excess amounts of waste or produce potentially harmful effects on the air and ecosystem. The industrial producers that generate waste need to pay for the disposal and particularly take caution in the way they dispose of hazardous materials. The industries should particularly focus on reducing the generation of hazardous waste as much as possible, as well as to practice the reuse, recycling and recovery as crucial factors for enhancing the overall waste managing process.

Summarizing, the need of planning environmentally friendly production processes from industry side is more than necessary.

One important aspect of waste management planning, in general, is to identify the areas in which specific measures should be taken to reduce the environmental impacts of waste management (Banar, Cokaygil, & Ozkan, 2009).

Waste management optimization models

Solid waste management is a complex and multidisciplinary problem that should be observed from technical, economic and social perspectives, based on sustainability, and managed by following the solid waste management hierarchy.

A lot of research on modelling solid waste management systems has been done so far as a necessary basis for developing a framework for evaluation of the municipal solid waste management strategies. The studies on determining the mod-

els and techniques for waste management began to develop in the 1970s and they mostly focused on the economic aspect of the waste management. Later on, in the 1990s, the environmental aspect (mainly recycling) in the waste management models was considered as well. The latest models for waste management include both, economic and environmental perspective (Banar et al., 2009).

The optimal waste management models need to cover several aspects:

- to integrate the changing demands of societies and their market forces,
- to ensure acceptable environmental sustainability of the industry/plant,
- to ensure profitability when actions are taken.

A variety of decision support models for solid waste management are developed, with most of them belonging in one of the three decision support frameworks (Communities and Local Government, 2009; Finnveden & Björklund, 2007; Karmperis, Aravossis, Tatsiopoulou, & Sotirchos, 2013; Linkov, Satterstrom, Steevens, Ferguson, & Pleus, 2007; Mendoza & Martins, 2006; Moutavchi, 2012; Neste & Karjalainen, 2013):

- Life Cycle Assessment (LCA), focused on the environmental performance of the waste management systems,
- Cost-Benefit Analysis (CBA), focused on the economic performance of the waste management systems,
- Multi-Criteria Decision Analysis (MCDA).

Each decision support framework²⁹ includes a basic model serving as a guide, and alternative models that can be designed within the framework, by changing the assumptions and constraints, or the goals which are set by decision-makers in the basic model (Karmperis et al., 2013).

Life Cycle Assessment (LCA) models

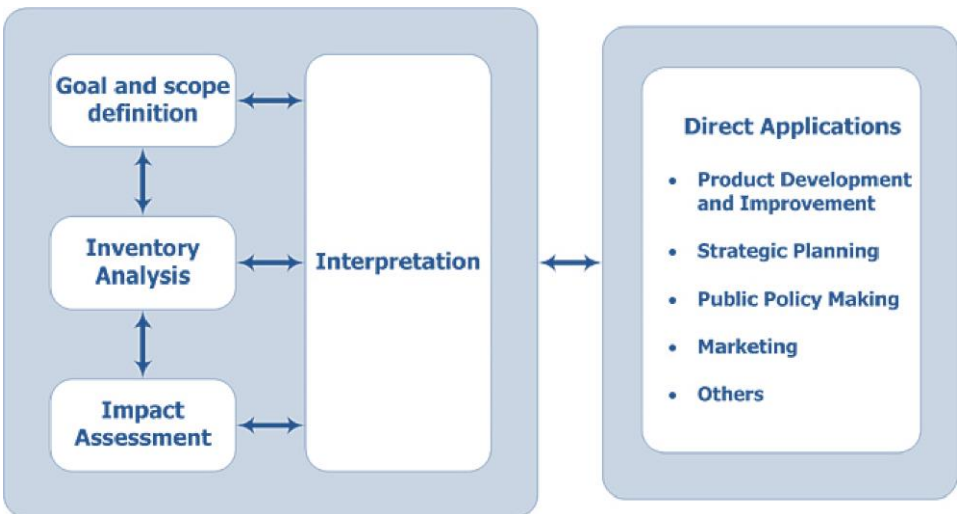
The LCA models are a system analysis tool used to quantify the environmental impacts of products throughout their “product” life (i.e., cradle-to-grave), starting from raw material acquisition through production, usage and disposal

²⁹ “A decision support framework can be defined as a broad outline of interlinked items supporting stakeholders in a decision-making approach for specific objectives and also serving as a guide that can be modified as required by adding or deleting items.” (Karmperis et al., 2013, p. 1290).

(Marques et al., 2014). The term “product” includes not only product systems but also service systems, e.g., waste management systems.

The simplest LCA analysis, as presented in Figure 3.14 (left square), consists of four phases: *Goal and scope definition*, *Inventory analysis* (an inventory of relevant inputs and outputs of a system), *Impact assessment* (evaluation of the potential impacts of the respective inputs and outputs) and *Interpretation of the results* (Banar et al., 2009; Finnveden & Björklund, 2007; ISO, 2009; Sarigianis, Handakas, Karakitsios, & Gotti, 2021).

Figure 3.14. The basic model of LCA framework



Source: Karmperis, Aravossis, Tatsiopoulos & Sotirchos (2013, p. 1291).

In the first phase the product, its relations to the alternative products and the level of analysis are defined.

The second phase involves identification of all inputs and outputs of the studied product. It is not an easy task because it needs a lot of information and several assumptions must be considered. Hence, several databases for quantification of the emissions obtained from both, the product and its management operations, were developed (Marques & Da Cruz, 2016).

The significance of the potential environmental impact of the product inputs and outputs for each impact category is determined in the third phase. The environmental indicators are calculated utilizing the following expression (1) (Tukker, 2000).

$$S_i = \sum_{l=j} E_j \cdot e_{ij} \quad (1)$$

where are:

i – impact category (global warming, human toxicity, aquatic eco-toxicity, acidification, non-renewable resource use, etc.),

j – single unit of intervention,

E_j – magnitude of the environmental intervention,

S_i – score on the impact category.

Data analysis and interpretation of obtained results is given in the fourth phase of the LCA. In this phase recommendations about the necessity of minimizing products' environmental impact should be also included.

Although it was shown that findings from LCA modelling are consistent and policy-relevant because of some of its disadvantages like the simplification of the model compared to real waste management problems, the subjectivity and arbitrariness of some of the assumptions introduced in the LCA model, it is difficult to generalize the conclusions from case studies to policies.

The LCA analysis can evaluate the benefits of different waste treatment techniques such as the production of heat and electricity from incineration, production of new raw materials that can replace production from virgin materials, furthermore it can determine quantitatively all the emissions from waste management systems into water, land and air, the time dimension of emissions of greenhouse gases, and can estimate the effects arising from products consumption on humans.

Cost-Benefit Analysis (CBA)

Waste management economics, in particular its cost aspects, is undoubtedly related to environment and health, both in corporate and societal terms. It was shown that a good relation between the industrial preventive environmental protection strategies and substantial savings exists. It was also shown that the efficient management of industrial waste improves the competitiveness if handles the waste properly (Stypka & Flaga-Maryńczyk, 2013).

Generally, CBA is an analytical tool for estimation of the total costs and benefits from a planned project. Although CBA is typically applied on projects, in the recent years it has been widely used as evaluation technique for waste management systems.

Minimization of costs is one of the necessary criteria to select the most economical scenario. However, environmental impacts and benefits may divert the recommendations towards sustainability, which is currently more desired by societies seeking long term environmental benefits and conserving natural air, water and soil resources (Elagroudy, Elkady, & Ghobrial, 2011).

Usually, the CBA of waste management systems is studied on a case-by-case basis as the environmental benefits and costs are correlated with the project scope (landfilling, incineration, recycling or solid waste baling fuel schemes). Most benefits of investments in waste management usually arise through environmental protection, e.g., saving of groundwater resources and limitation of CO₂ emissions (Karmperis, Sotirchos, Aravossis, Tatsiopoulos, 2012). The decision-making on waste management options using CBA should be based on the overall net benefits and costs to society, e.g., although recycling costs are more than the conventional landfilling method, it should be preferred as provides more environmental benefits.

According to the Guide to CBA of Investment Projects of the European commission (EC, 2008) the basic model of the CBA framework consists of six phases, graphically presented as follows (Figure 3.15).

Figure 3.15. The basic model of CBA framework



Source: Karmperis, Aravossis, Tatsiopoulos, & Sotirchos (2013, p. 1293).

In the first phase of the modelling the socio-economic context is analyzed, and the project goals are identified.

A complete description of the project in terms of defining the life cycle phases and determining what costs and benefits will be introduced in the selected model should be given during the second phase of the CBA framework.

In the third phase the most suitable technology for the waste treatment should be selected and the possible scenarios with and without investment should be considered.

The next phase is to make a financial analysis for the observed waste management system by following the discounted cash flows and using a financial discount rate. Also, in the fourth phase the financial sustainability of the system is assessed by calculating the financial indicators.

In the fifth step the economic indicators, net present value, NPV, internal rate of return-IRR and the ratio benefit/cost, BCR, are evaluated. Expressions (2) and (3) are used for calculation of NPV and BCR:

$$NPV = \left[\sum_{i=0}^n B_i / (1 + d)^i \right] - \left[\sum_{i=0}^n C_i / (1 + d)^i \right] \quad (2)$$

$$BCR = \frac{\left[\sum_{i=0}^n B_i / (1 + d)^i \right]}{\left[\sum_{i=0}^n C_i / (1 + d)^i \right]} \quad (3)$$

where are:

B_i – benefit in year i ,

C_i – cost in year i ,

d – discount rate,

i – number of years.

The waste managing project under observation will be feasible if the value of NPV and BCR is greater than 1.

For regulatory CBA, NPV is the correct criterion (Boardman, Greenberg, Vining, & Weimer, 2006). Estimates of BCR are sensitive to how the impacts of a proposal are categorized and can give conflicting results to NPV. As such, NPV should be preferred in the CBA of proposed regulation.

In the final, sixth, phase of the CBA framework risk assessment analysis should be carried out in order to check if the selected waste management option satisfies the real-life performance indicators. If it is not the case, measures for risk mitigation should be recommended.

One of the main disadvantages of the CBA for waste management is the difficulty to express in monetary terms the environmental impact of a MSW plant because of the complexity of the analyzed ecosystems.

In order to overcome some of the weaknesses of the existing CBA models a lot of work has been done for their modification and as a result the waste managements' efficient decision model (WAMED) was obtained. The WAMED model enables waste managers to conduct a comparative analysis of estimated, actual and prevented financial damages during the implementation of some waste management scenario (Moutavtchi, 2012). It is "a novel integrated approach for solving the problem of simultaneously decreasing the negative impacts of municipal solid waste on the environment and the health of the population while providing an information support tool for decision making in municipal solid waste management at regional and municipal levels to improve small-and medium-sized company competitiveness in particular" (Moutavtchi et al., 2008, p. 62).

Multi-criteria decision analysis (MCDA)

When solid waste management systems are designed multiple alternative solutions have to be studied because these systems might have complex impact on a variety of stakeholders.

Many researchers have found the MCDA as a successful approach to solve this design problem and to help decision makers to select the most preferable decision (Cheng, Chan, & Huang, 2002).

The MCDA approach can provide a thorough analysis and understanding of the problem, inclusion of quantitative and qualitative parameters into the decision process, inclusion of different group interests into the analysis process and elasticity of the decision process, which is missing in the economic models. Furthermore, it enables to change the results of the modelling by changing the values of subjective parameters. However, MCDA is too complex for operating because of its difficult vocabulary and procedures and only skilled users can do the modelling.

MCDA methods utilize a decision matrix to provide a systematic analytical approach for integrating risk levels, uncertainty, and valuation, which enables evaluation and ranking of many alternatives (Linkov & Steevens, 2009). Different techniques, like Simple Weighted Addition method, Weighted Product method, TOPSIS, cooperative game theory, and ELECTRE require diverse types of value information and follow various optimization algorithms. There are certain techniques that rank options, some of them identify a single optimal alternative and some techniques differentiate between acceptable and unacceptable alternatives (Odu & Charles-Owaba, 2013). As a whole, the ending result of the application of MCDA is a comprehensive, structured process for selecting the

optimal alternative in any given situation, drawing from stakeholder preferences and value judgments as well as scientific modelling and risk analysis. This structured process would be of great benefit to decision-making for homeland security, where there is currently no structured approach for making justifiable and transparent decisions with explicit trade-offs between social and technical factors.

The MCDA framework links technological performance information with decision criteria and weightings obtained from decision-makers, allowing visualization and quantification of the trade-offs involved in the decision-making process. MCDA is of great utility in different areas, e.g. it is used for selection of the optimal landfill location (Mirakovski, Peltechki, Despodov, Boshev, & Panov, 2013), considering the problem influenced by numerous and sometimes contradictory aspects, then for comparing different waste collection and management alternatives (Cheng et al., 2002) as well as for testing the feasibility of a decision-making method developed to be applied in particular conditions in which environmental and social aspects must be considered (Garfi et al., 2009).

In some studies, the multi-criteria decision analysis was used alongside with a geospatial analysis for the selection of hazardous waste landfill sites (Sharifi et al., 2009). They employ a two-stage analysis to provide a spatial decision support system for hazardous waste management in a typically underdeveloped region. Geographic information system (GIS) was used for performing the initial screening process to eliminate unsuitable land and the second stage was utilization of a multi-criteria decision analysis to identify the most suitable sites using the information provided by regional experts with reference to new chosen criteria. MCDA was also used to evaluate the impact of various operational and construction bioreactor landfill strategies on project economics (Moutavtchi, 2012).

Conclusions

Summarizing, all of the above-mentioned models are applicable to selected waste management scenarios and in order to have less environmental impact the waste management systems should be analyzed by utilizing the integrated approach which involves simultaneous use of more than one model.

KEY TERMS

Waste management, waste management hierarchy, optimization model, life cycle assessment, cost benefit analysis, multi-criteria decision analysis.

SUBCHAPTER SUMMARY

The most commonly generated waste types and the characteristics of different waste streams are described within this Subchapter. The **waste management practices implemented at a global level are described as well.**

The main focus of the Subchapter is primarily on reviewing some of the approaches used for optimizing the waste management systems. The data are based on a literature review of relevant research studies and publications reported in **the last decade.** Three different decision support frameworks: Life Cycle Assessment (LCA), Cost Benefit Analysis (CBA) and Multi-Criteria Decision Analysis (MCDA) are analyzed with regard to their basic models and modifications.

The outputs from the LCA modelling are consistent and policy-relevant but as a result of the simplification of the model compared to real waste management problems and the subjectivity and arbitrariness of some of the assumptions introduced in the LCA model, it is difficult to generalize the conclusions from case studies to policies.

The CBA of waste management systems is usually studied on a case-by-case basis as the environmental benefits and costs are closely related with the project scope. One of the main disadvantages of the CBA for waste management is the difficulty to express in monetary terms the environmental impact of a MSW plant because of the complexity of analyzed ecosystems.

WAMED, the latest modification of the CBA model, overcomes CBA limitations and enables waste managers to conduct a comparative analysis of estimated, actual and prevented financial damages during the implementation of a particular waste management scenario.

The MCDA framework links technological performance information with decision criteria and allows visualization and quantification of the trade-offs involved in the decision-making process.

The findings imply that there is no dominant municipal solid waste management model and each of the observed models is applicable to particular waste management scenario. However, the LCA models seem to be the best choice when seeking the best sustainable development solutions.

In order to have less environmental impact the waste management systems should be analyzed using the integrated approach which involves simultaneous use of more than one model.

DISCUSSION QUESTIONS

1. Why are landfills environmentally harmful?
2. Suggest ways to reduce the amount of solid waste in your local surrounding.
3. What are the best methods to collect and analyze the solid waste generated at your faculty campus?
4. Are there limitations of the LCA, CBA, and MCDA waste optimization models?
5. What waste management services does your faculty/locality provide?
6. Packaging. Is it waste? Please explain.
7. Zero waste –a state of mind or achievable solution!?

TEACHING METHOD/TECHNIQUE

- face-to-face lectures,
- distance/online learning,
- exercises,
- case studies,
- problem based learning,
- buzz groups / cross-overs / role play,
- individual assignments.

Students will engage in active student-centered learning, before, during, and after class sessions. They will have the possibility to conduct both desk/empirical research to devise feasible strategies, ideas and solutions. The lecturer's role will be to deliver the course to the students and to guide them through the process of exploration, elaboration, and learning the course material.

The students will work on projects in groups (buzz groups / cross-overs), and depending on their preferences, they will have the possibility to prepare individual project as well. Role play as a teaching method will be also used.

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3.3. From industrial agriculture towards ecological farming – necessity or opportunity

Ilaria Colivicchi^a

LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- understand the possibility to practice sustainable agriculture,
- analyze an environmental integrated process,
- consider farm as an ecosystem,
- recognize the best practices for regenerative agriculture,
- comprehend the holistic management of risk in the farm.

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Sustainable industrial agriculture against dangerous practices

Beginning in the 1960s, a series of advances in agricultural science and technological innovations ushered the so-called green revolution, the term used to designate an integrated system of pesticides, chemical fertilizers, and genetically uniform crop varieties to ensure high yields, which have been assiduously adopted worldwide by governments and businesses.

There is no doubt that such a process and the innovative agricultural techniques based on genetics have allowed agricultural and breeding practices, in Italy as in the rest of the developed countries, a great increase in terms of productivity and, in general, of food production. In the same way, it is clear that, however, the evolution of agricultural practices has taken place at the expense of sustainable methods of agriculture and the expense of natural resources, and, more generally, of the environment.

Today, the sector, especially where this has structures characterized by high intensification and large-scale specialization, is considered to be among the main causes of water pollution, soil erosion, pollution, and soil acidification; the increase in the greenhouse effect, the loss of habitat and genetic and species diversity; of the alteration and simplification of traditional landscapes (Muller et al., 2017).

These innumerable environmental externalities cause a very high economic cost, which industrialized food producers rarely pay. Furthermore, although the agricultural sector currently produces more food than would be enough to feed humanity, a large part of the world's population still suffers from hunger or severe food shortages. A similar scenario occurs since many populations do not yet have access and availability of sufficiently varied and healthy food, or the tools to produce it: this is mainly a problem of distribution rather than production. As further proof of this paradox, we are witnessing a rapid increase in obesity rates worldwide, a symptom of an overproduction of food in industrialized countries: this circumstance represents a great invitation for agri-food companies to engage in the production of excess food, highly processed, and market and distribute it to consumers in excessively large quantities (Vulcano et al., 2017).

In recent years, there has been the emergence of some forms of agricultural production that are alternative to monoculture and industrial ones, oriented towards environmental and social sustainability and agroecological principles. These

methods of production were presented as effective solutions to relate, on the one hand, sufficient levels of food production, on the other, the protection of the environment in general and the protection of biodiversity in particular. These forms of production, even if very diversified and assimilated in the expression of diversified food systems, include all those “agricultural practices [...] that intentionally include functional biodiversity at multiple spatial and/or temporal scales, to maintain ecosystem services that provide crucial inputs to agriculture, such as soil fertility, pest and disease control, water use efficiency, and pollination” (Kremen & Miles, 2012).

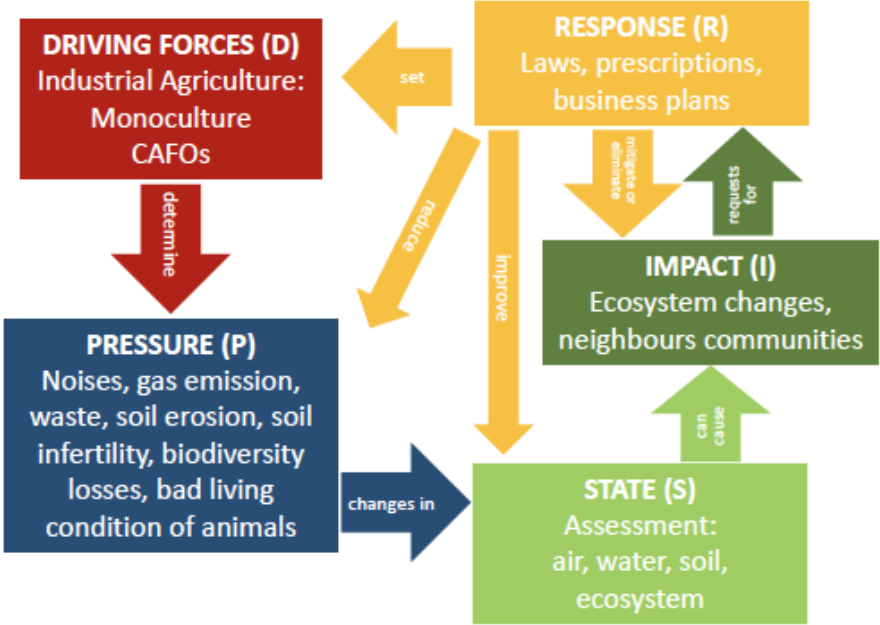
The first studies relating to the issue of sustainability were carried out by the United Nations immediately after the Conference for the Environment and Development held in 1992 in Rio, Brazil.

The European Environmental Agency [EEA] (1998) in the report proposed the adoption of indicators that can represent a specific environmental matrix to achieve an integrated approach in the reporting processes carried out on the state of the environment. In this way, the set of elements and relationships that characterize an environmental phenomenon can be represented, relating it to any policies exercised on it. The reference model is the DPSIR, i.e. Driving forces, Pressure, State, Impact, and Response (Kristensen, 2004).

The Driving forces are both anthropogenic actions deriving from human activities regarding the industrial, agricultural, transport, etc., sectors, and from natural actions that determine significant impacts on the environment. The Pressures indicate anything that can alter the environmental situation, for example, atmospheric emissions, noise, electromagnetic fields, the production of industrial waste and discharges, urbanization, and deforestation. The category States addresses the physical, chemical, and biological qualities of environmental resources such as air, water, soil, etc. Within Impacts, the negative effects on ecosystems, health, and the economy are analyzed. Finally, concerning the Responses, the government actions aimed at combating environmental problems, programs and objectives to be achieved are highlighted.

During the nineties, the Organization for Economic Co-operation and Development (OECD) (an international organization to create better policies for better lives) suggested using the theoretical framework DPSIR for the representation of agriculture-environment relations.

Figure 3.16. DPSIR model in agriculture



Source: Author's own elaboration.

Together with the activities of the Joint Research Centre and EUROSTAT, the European Commission subsequently designed a set of indicators aimed at assessing the progress of the Fifth Framework Program. This activity has received further stimulus and development from notable contributions, both theoretically and practically, arising from national, European, and extra-European experiences.

The lack of a univocal and shared definition of the concept of sustainability emerged from the complexity of the aforementioned studies; and, consequently, the lack of a common methodology for its measurement, which suffers from the use of non-homogeneous and variable reference indices (quantitative and qualitative) concerning the different national contexts. Therefore, serious discrepancies have arisen of a general nature (relating to the objectives attributed to sustainability) and of a particular nature (relating to the quality of the data on which to base the measurement).

A fundamental aspect, to develop a set of sustainability indicators, is represented by the adoption of a specific and precise concept of sustainability, developed from scratch or identified among the numerous ideas available to us in the literature. Of the numerous and sometimes contradictory definitions of sustainability

that exist, perhaps the most used and referred to in this proposed methodology for measuring sustainability is that contained in the Bruntland report – *Our common future* (1987) – of the World Commission for the Environment and the Development established by the United Nations which, due to its “breadth”, is, in fact, the most widespread and generally accepted and shared one, especially at the institutional level. According to this definition, sustainable is that “development that satisfies the needs of present generations, without compromising the possibility that future generations can satisfy their own” (World Commission on Environment and Development, 1987, p. 41).

Such an approach to sustainability is based on the principle of preserving production possibilities, that is, production capacity as a function of the availability of factors. The concept of sustainability is therefore interpreted in the moral duty of each generation of people, towards the next one, to guarantee the availability of a non-decreasing stock of capital over time. Exposed in this way, the concept of sustainability entails the possibility of substitution between the different elements of the capital, in such a way that a generic capacity to produce, rather than a specific component of capital, can be passed on to future generations.

This interpretation, which contemplates the possibility of substitution between the components of capital, is faithful to the overexposed concept of “weak” sustainability: development is sustainable even if certain components of capital (for example natural capital) decrease, provided that the total capital does not decrease. Most of the ecological literature rejects, however, the complete substitutability between natural capital and other forms of capital. According to this more restrictive approach, a variant of the “constant capital” rule is valid, that is the concept of “strong” sustainability, according to which natural capital must remain constant or increase, while always within the more general constraint under which the stock of capital remains constant or increases.

Our knowledge of natural capital involves great uncertainty. Therefore, probably assuming widespread collective risk aversion, there is a series of good reasons for not using natural resources in such quantities as to exceed the level considered critical for the conditions of existence or reproducibility of the resource itself. The irreversible nature of a part of the natural capital and the profound uncertainties about its knowledge are fundamental factors in the definition of strong sustainability. A further variant of the concept of “strong” sustainability emerges from the attribution of an important detail to certain components of natural capital considered “critical” natural capital, that is, those components that provide irreplaceable environmental services: the functions of “life support” of ecosystems.

According to this variant of “strong” sustainability, the capital defined as “critical” must not reduce over time, while the use of the other components of natural capital not considered to be characterized by particular critical elements can be analyzed from the perspective of “weak” sustainability. The contrast between these positions gives rise, as indicated in Agenda 21, to a concept of multidimensional sustainability, which embraces environmental, economic, and social objectives. Between the different dimensions of sustainability overexposed, there is indeed a multitude of relationships. The pursuit of objectives of different nature can be stimulating to seek particular synergies, but, at the same time, it could generate numerous contrasts. The solution can be offered by active search, through appropriate political decisions, for a set of balanced practical and operational activities.

According to an interesting proposal by the National Institute of Agricultural Economics, now merged with the Council for Agricultural Research and the Analysis of the Agricultural Economy, the social dimension refers to equity understood as “equal opportunities”, both at the territorial level between rural and non-rural areas, both at sector level between agriculture and other economic sectors, between social groups and between men and women involved in the sector. The critical issues taken into consideration within this dimension are those related to employment opportunities and farmers’ access to resources and social services.

The environmental dimension refers to the management and conservation of natural resources with respect to the ecosystem. This dimension is analyzed regarding a series of environmental objectives considered particularly relevant: protection of the landscape and biodiversity; protection of water resources, soil, and air.

To measure sustainability for each of the three dimensions and identify a set of priority objectives, concerning each of them, they are subsequently selected by the indicators.

In particular, the social dimension is analyzed according to two aspects: human capital, regarding the characteristics of agricultural tenants and the incidence of agricultural employment within the economic system; equal opportunities with an eye to gender differences among the employed and, in general, the rural population.

The economic dimension is analyzed regarding three fundamental characteristics: efficiency, understood mainly as the use of production factors; the vitality

of the farm, referring to the ability to remain on the market; competitiveness, which depends on the size of the primary sector's contribution to the formation of national wealth, and the process of capital accumulation within it.

The indicators used to refer to the DPSIR model allow for the appropriate structure and organization of environmental information. Many of the indicators included in the social and economic dimensions are taken from other disciplinary areas and are exploited through the assessment of sustainability by attributing different values to them. Five indicators relating to the environmental dimension, based on the politically relevant environmental objectives are identified in advance: soil, atmosphere, water resources, biodiversity, and landscape.

Soil is considered a dynamic element and a non-renewable natural resource. Its exploitation by the primary sector has contributed to the degradation of its chemical, physical and biological characteristics. The proposed indicators are aimed at assessing the dynamics existing between agriculture and soil through measures that highlight the impact of agricultural activity resulting from farming, the adoption of fertilizers, and other pollutants.

Measuring the damage to agricultural activity in terms of air quality is very difficult. Although agriculture does not represent the major source of emissions into the atmosphere, it still plays a fundamental role in reducing the ozone layer through gas emissions. The indicators that refer to this environmental component, therefore, aim to represent the quantity of these emissions and the energy consumption responsible for a part of the emissions.

The links between agriculture and water resources also represent a rather complicated scenario, a cause of the difficulties related to the isolation of the impact generated by agricultural activity compared to that generated by other activities. The assessment of the sustainability of water use in agriculture was represented by considering: the quantitative aspect (the exploitation of water resources and their management); the qualitative aspect, relating to the possibility of pollution of water resources.

According to the definition expressed by the Convention on Biological Diversity (n.d.), "biological diversity is understood as the variability of living organisms of all origins, including, inter alia, terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species and between ecosystems".

Biodiversity can be analyzed as genetic diversity, which refers to the diversity between genes within "domestic" plant or animal species; as diversity between

species, i.e., the quantities of species and, therefore, the varieties of fauna and flora involved in agriculture, including the soil, and the consequences of the presence of alien species on agriculture; finally as the diversity of ecosystems, inherent in the diversity of species, processes and ecological functions that occur within the various ecosystems “consisting of new species relevant to agriculture or communities of species dependent on agricultural habitats” (OECD, 2001).

The landscape is presented as an environmental component with a degree of complexity of evaluation similar to that of the aforementioned biodiversity, due to the complex articulation of the elements of which it is composed, as it is connected to biodiversity given the similar nature of relations with agriculture. The landscape is mainly assessed through “indirect” indicators that represent factors of the environmental impact of agricultural activity and reasons for changes in the shape and structure of the landscape (e.g., concentration and intensification of agricultural activity). To assess the environmental components of biodiversity and landscape, some indicators relating to the forest area are also considered, since it represents a fundamental element for the assessment of aspects related to the naturalness of the agro-ecosystem.

For each dimension considered (economic, social, and environmental), a set of priority objectives was therefore circumscribed in the light of which the indicators were then selected. The whole process of selecting and classifying the indicators is carried out by carefully considering that only the simultaneous pursuit (complete or partial) of all objectives can guarantee that the highest sustainability objective is achieved.

To predict and simplify any international comparisons of results, the indicators were used with the DPSIR scheme (Determining forces, Pressure, State, Impact, Response).

In light of the definitions of the European Environment Agency, the driving forces (D) are the main reasons for the environmental pressures. The pressures (P), on the other hand, represent the causes of the problems directly and include the actions that produce the environmental impacts. Status indicators (S) offer a representation of environmental conditions regarding the quantity and quality of environmental resources. Impact indicators (I) refer to changes in the state and the effects of the driving forces. Finally, the response indicators (R) concern the measures adopted at the end of the resolution of the various problems identified (for example, agro-environmental measures or more restrictive environmental standards) or the actions taken by the company in response to environmental changes. These can be divided into operations to prevent and/or mitigate nega-

tive impacts; repair environmental damage; to safeguard or restore the state of environmental resources (EEA, 1998, Annex 3).

A set of indicators constructed in this way has the great advantage of being flexible and modifiable as the values of society and political priorities change, and as knowledge grows. The indicators represent one of the fundamental tools for monitoring and evaluating sustainability, allowing to verify the progress of economic activity, such as agriculture, to meet the sustainability objectives; to highlight the compromises between the three economic, social, and environmental dimensions, and between the sectors of the economic system.

It is also true that effective use of a similar tool in the decision-making process requires that the value of each indicator can be compared with predefined values, such as thresholds, standards, target values, which are sometimes difficult to identify. However, this comparison can allow an interpretation of the indicators in the light of the predefined objectives. Regarding criticism that lies in the provision of which indicators should be adopted in the specific case, it is of fundamental importance to identify the necessary and sufficient conditions for sustainability, starting from the definition of the sustainability criteria for each of the three dimensions, economic, social and environmental.

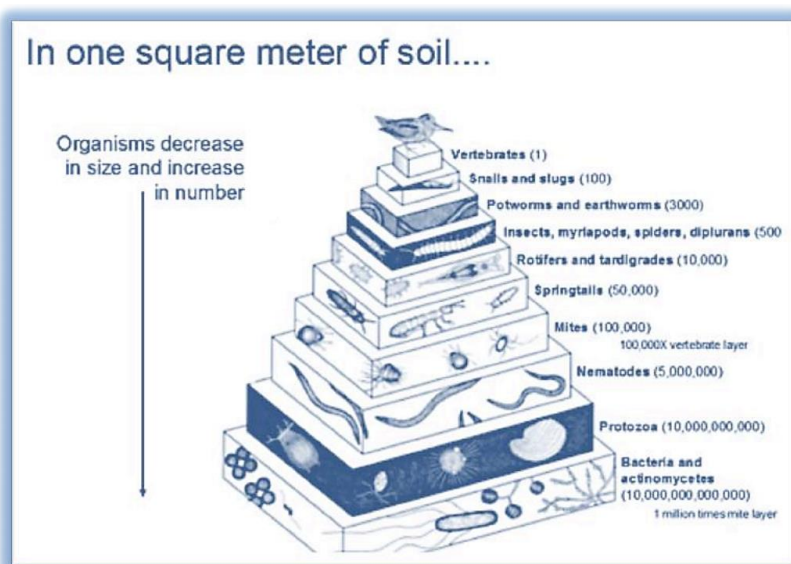
The simultaneous assessment of progress in all the dimensions considered allows for obtaining a complete overview of the situation.

Farm as an ecosystem

A collectivity of organisms interacting in their natural habitat constitutes an ecosystem. Plants are the basis of every biological community since with their photosynthetic abilities they transform solar energy into chemical energy. Insects, animals, and humans are linked to plants to obtain essential nutrients for life. The cycle continues as plants and animals are subject to decomposition by bacteria and fungi of the material that is recycled (Brunetti, 2015).

Ecological agriculture uses production methods that want to guarantee the conservation of natural resources and consequently obtain products that are also natural for the final consumer. This cultivation process assumes that the farm itself constitutes an ecosystem and is therefore managed in compliance with the entire cycle of the nature: soil, organisms living in it, both vegetable and animal, fungi, and microbes.

Figure 3.17. Colonies of organisms in the soil



Source: Idea Regeneration Systems (2016).

The microbes in the soil live in consortia and naturally develop relationships that keep biogeochemical cycles active, first of all, that of nitrogen.

Interaction with crops increases their health and productivity and guarantees functional biodiversity.

If, due to an environmental forcing such as the use of pesticides, a consortium of microorganisms is not able to perform its normal function, the quantity of organic substance in the soil can be inadequate, compromising the production itself and having a strong impact on the ecosystem.

Sustainable agriculture must in itself imitate the nature in its ability to regenerate itself maintaining the health of the soil, safeguarding the vital processes of microorganisms (with biodynamic processes or with compost), and guaranteeing the safeguarding of polyculture systems and natural vegetation.

The aim is to encourage the biodiversity of nature and therefore environmental sustainability by cultivating and raising livestock with techniques with low impact on ecosystems.

Ecological agriculture carries out non-invasive interventions on the soil, does not use chemicals (in some cases there are exceptions if provided for by the European Community regulation), and does not use GMOs.

Even concerning livestock breeding, the companies pursue the same ecological principle on their land to keep the different habitats natural.

The action of grazing animals contributes to the maintenance of stable meadows by favoring the settlement of both existing and new microbial species. It is very important in such farms to balance the cultivation of vegetables and animals according to the species most adapted to the biological characteristics of the area. In this way, crops and animals are more resistant to disease without having to use chemicals. These business management processes increase biodiversity with a positive impact also on the quantity of production. As mentioned above, there is a ban on the use of GMOs, pesticides, antibiotics, synthetic fertilizers, additives, and adjuvants in food. For the breeding of livestock, organic fodder is used alongside free pasture. Another aspect of fundamental importance for ecological agriculture is certainly the reduction of greenhouse gas emissions that impact climate change.

Methods used in an ecological farm

Soil deterioration has a major impact on climate change and human health. Monoculture is one of the elements that influences the loss of biodiversity most and thus contributes to soil degradation. The United Nations 2030 Agenda for Sustainable Development places biodiversity at the center of interventions in agriculture and sustainability processes must include reconstruction as their objective.

Research conducted on soil biodiversity is used to restore the quality of soil, water, food production, and more generally to combat climate change at a local and even global level (Bach, Ramirez, Fraser, & Wall, 2020).

The soil constitutes a real vital complex; soil organisms, microscopic and macroscopic, are the true sustenance of all ecosystems.

Soil biodiversity is the main factor that integrates multiple functions performed by the ecosystem and for this reason, it is the cornerstone for holistic sustainability. Researchers from all over the world put soil biodiversity at the center of the processes that will have positive impact on the climate, on the restoration of natural areas and water, and, more generally, on degraded ecosystems.

If soil and biodiversity are the foundation of sustainable agriculture, the goal will be to achieve sustainable agricultural production. To do this, sustainable agricul-

tural processes centered on the biology of the soil itself will increasingly be needed in the future. Biologists show evidence that tillage with plowing hurts soil organisms (earthworms, insects, and mites) while processes without or with reduced plowing preserve a higher percentage of fungi than bacteria. Tsiafouli et al. in 2015 showed that annual tillage reduces soil biodiversity by favoring small-sized organisms over grazing lands. If the soil is populated by multiple organisms, smaller and less taxonomically diverse soil communities can lead to lower crop yields and lower nitrogen turnover, and lack of ecosystem nutrients. Of great importance are also the crops that allow the soil to be covered during the period in which the main crops are not produced. The roots of cover crops reduce soil erosion and generate food for fungi and microorganisms in general.

Crop rotation changes the types of soil inhabitants and different carbon production. In some systems, the increase in organic carbon in the soil can lead to higher production.

Traditional crops exploited the diversity of different plants and their rotation to have greater production and less presence of weeds.

Soil biodiversity is therefore the main focus for sustainable agriculture. The use of grazing land produces a beneficial impact on the soil and opens up a new way of being a farmer according to a balance between agricultural cultivation and livestock breeding. The cultivation of cereals represents agriculture considered perennial; after having harvested the product it becomes pasture and therefore carries out a function of feeding the livestock, but also covering the ground as a meadow. The production of cereals and forage is therefore integrated with a grazing system. The advantages in terms of eco-sustainability are many and the low planting costs are positive elements for farmers.

Best practices to attain the goal of environmental sustainability: Holistic management of risk

The practice of agriculture dates back to about 11,500 years ago while industrial agriculture only developed in our century. However, industrial agriculture has become so widespread that nowadays sustainable agriculture is often called “alternative” (National Research Council, 1989).

Many studies show that the growth of industrial agriculture has not only been a response to the demand for greater food production in support of population

development but has also been encouraged by regulations and funding from many states that have contributed to its strong expansion.

Regenerative farmers have initiated a return to sustainable crops to reduce the use of chemical fertilizers and pesticides through the implementation of modern cultivation techniques that improve the condition of the soil through crop rotations which, unlike in the past, are not left to the farmer's experience alone but are supported by specific studies. Even the breeding of low confinement animals leads to significant benefits for the health of livestock, but also significant advantages for the environment and therefore for humans.

Outdoor pastures reduce the need to produce food to feed livestock (mainly corn) and thus reduce the emission of greenhouse gases into the atmosphere. The animals left free to graze with their excrements favor the regeneration of the soil and greatly reduce the need to concentrate the manure in special collection centers which can also cause water pollution. In more recent years the attention of consumers, thanks also to the popular campaigns of many scientific commissions, international agencies, activist organizations, and concerned citizens, has turned towards the quality of food products, and the organic production of food has gained an important market segment.

Organic farming has therefore expanded enormously in recent years, and is more widespread. Sales of organic food from 2006 to today have tripled. Just think that only on the American land, where monoculture has spread enormously, farmers are responding to the market demand for organic food with an increase.

Some farmers are developing agricultural and livestock farming processes intending to store carbon in the soil using particular techniques based on experimental studies. In this model of “carbon agriculture”, as it is generally called, the farmer must rely on the enhancement of the internal resources of the property following a crop rotation. It is necessary to keep all the soil covered by vegetation, to prevent the erosive action of atmospheric agents (in particular wind and water). This agricultural process allows microbial organisms to be kept active. Planting perennials over annuals creates an underground root system that further promotes macrobiotic life. The crops are also alternated with plants that grow in nature to encourage the creation of pastures. The grazing of the animals is left free for using natural rather than chemical fertilizers that can compromise the life of the subsoil.

If there are situations in which the soil remains uncovered, the studies conducted suggest mulching the soil to protect the soil from climatic events, store water and allow the microbial life of the subsoil to recreate.

Figure 3.18. Soil protection with straw



Source: <https://www.weeklytimesnow.com.au/>

There are also regenerative agroforestry systems, which associate trees and shrubs with agriculture and livestock. Regenerative agriculture has positive impact on resources since it helps regeneration rather than absorption as is the case with industrial agriculture.

Soil health naturally creates resistance to pests and diseases without having to introduce chemical pesticides. The products of cultivation and breeding in regenerative agriculture are therefore also healthy for humans.

The regenerative farmer has a systemic and holistic vision of his company that combines ecological, social well-being with the purely economic one.

Combining several techniques some systems successfully focus on regeneration (Álvarez de Toledo, 2016), for example:

- Biodynamic Agriculture, which uses a series of unique preparations. One of the best-known preparations is the “500” which was studied by Rudolf Steiner to stimulate the processes of humus formation in the soil.
- Permaculture, which is a set of practices aimed at managing man-made landscapes to meet the needs of the population (food production, energy) but also the resilience, wealth, and stability of natural ecosystems. This new technique focuses on design and diversity, to foster abundant production in line with ecological soil treatment and an overall environmental balance.
- Holistic Management, a livestock management system integrated with soil regeneration.
- Keyline, an agricultural system designed to favor a particular non-invasive plowing technique that retains water thus stimulating the soil.

Figure 3.19. Permaculture



Source: <https://www.gardeningknowhow.com/>

Every economic activity is exposed to risk factors: agricultural activity is not an exception, indeed it is probably one of the most vulnerable activities from this point of view. This risk is to be found in the exposure of agricultural activity to numerous exogenous events, and therefore not controllable by the farmer. The classification of agricultural risk based on its types, although useful for defining the causes of risk factors and the uncertainty typical of this activity, does not allow us to appreciate an important dimension in the study of risk in agriculture: the “spatial dimension”. Risks can be categorized into two types: systemic risks, or risks that affect various economic agents spatially close to each other, or in any case linked by specific socio-economic links, and idiosyncratic risks, or risks, generally deriving from exogenous factors, which only affect an economic agent, or several economic agents not linked by spatial or other proximity.

Agriculture has always been considered a particularly risky sector. Running an agricultural business means facing a plurality of risks of different types. One of the possible classifications of the types of risk present in agriculture is the one that distinguishes among production risk, market risk, financial risk, social risk, institutional risk and personal risk.

Only some of them have peculiarities that make their consequences somehow specific for agriculture, either because of the characteristics inherent in the production related to the primary sector or because of certain harmfulness they represent for farmers.

The risk of production, or yield, is peculiar since production in agriculture, more than in other sectors, takes time and depends on natural conditions and events, which are beyond the control of the farmer.

Market risk is not typical of agriculture, on the contrary, it represents a risk that many European farmers in the past did not even have to worry about since distribution on the market at known prices was guaranteed by the common market organizations (CMOs). What today frames the market risk as a particularly current risk lies precisely in the substantial modification of the approach to the intervention of the European Union on agricultural markets, which will probably expose European farmers to price risk like never before.

The other risks, not significantly more serious for a farmer than any other entrepreneur, are, however, an important element within the overall risk inherent in agricultural activity. The reform of the Community agricultural policy itself is an example of institutional risk.

The purpose of recalling a similar classification of risks is to highlight how often we focus exclusively on the production risk, or, when we also take into account the price risk, we proceed by examining the two types of risk as if they were independent from each other. On the contrary, it would be necessary to understand the absence of the possibility and convenience of facing the different sources of risk separately from each other. What is important is the final result of the agricultural activity, or the general result from the point of view of the income of the complex of economic activities in which a farmer is involved, thus including any non-agricultural work activities, financial activities or investments. While it is correct in discussions of technical nature to consider the possible solutions and tools to deal only with the risk of the environment by isolating it from the other types of risk, it is not possible, when the attention is political, to consider the effects and consequences of adoption of similar tools, if not understanding how and to what extent the production yield impacts the more general objective of the economic sustainability of the agricultural population.

Focusing for a moment on the role, scope, and prospects of the development of yield insurance, the questions that should be asked, therefore, are the following: how much does the yield risk weigh on the overall income of Italian agricultural households?

Even if the variability of yields is high, does this represent economic damage? Far from being simple to find, the answers to these questions are not obvious.

The problem becomes even more important when, starting from the correct quantification of the impact of a particular risk on the well-being of a part of the population, the use of public resources designed to ensure equity remains.

When it comes to economic policy it is advisable never to forget that the public resources at our disposal are limited, and using them in a particular application always means taking them away from others. Therefore it would be desirable to ask the question of the effectiveness of public spending in one sector rather than another. The focal point is that the effects of a decrease or elimination of production risk can never be considered without taking into account the credit and savings structure of agricultural households.

The risk management tools available to farmers today are numerous. However, as a preliminary to the presentation of the aforementioned risk management tools, it is necessary to reflect on the fundamental aspect: the adoption of these risk management tools is a personal choice and, consequently, it is influenced, first of all, by the inclination of the farmer to make decisions aimed at managing the risk, and mitigating the volatility of the consequences related to the effects of positive and negative events. From the point of view of the economic agent, the determinants that generally affect decisions relating to the adoption of risk management tools are of dual nature. In the first place, risk aversion is understood as the condition that induces an economic agent to prefer a certain gain, but of a smaller entity, in the face of an uncertain gain, albeit with a higher expected value, represents a fundamental element behind the choices of economic agents and, therefore, of farmers (Moschini & Hennessy, 2001). Secondly, the consideration of risk, defined as the subjective perception of risks of objective nature, is an inclination that strictly depends on personal habits and experiences and is also changeable according to the degree of collective acceptability of the risk and influences the decisions of the economic agents in the face of risky situations (Sjoberg, 2000).

It is possible to consciously evaluate what can be defined as the second level of risk management: the choice of restoring to ex-ante management tools, or strategies to promote and stimulate the autonomous risk management capacity by the farmers themselves, regardless of whether or not the unwanted event occurs, or applying ex-post management tools, or strategies aimed at compensating for the damage deriving from adverse events of any kind. On the one hand, ex-post instruments indeed tend to be similar to public intervention, such as the payment of compensation in case of natural disasters or the intervention of economic agents who apply the principle of subsidiarity in favor of those farmers who

suffered particularly damaging events. On the other, the range of ex-ante management tools available to farmers is now vast and deserving particular attention (Santeramo, Capitanio, & Adinolfi, 2014).

It is possible to mention, among the ex-ante risk management tools, crop diversification, the use of particularly resistant crop varieties, the use of efficient irrigation systems and practices, the adoption of anti-hail sheets, the provision of particular structures against insects, the use of synthetic chemical inputs, which will be discussed later, such as pesticides or herbicides, the allocation of part of the time available for extra-company work, the stipulation of supply chain contracts, the assignment of coverage operated with financial derivatives and, obviously, the underwriting of insurance policies. The list would be very long and any strategy aimed at reducing the possible consequences of favorable or unfavorable circumstances, and therefore aimed at stabilizing yields, production, and prices, can be a potential ex-ante risk management strategy.

It is certainly true that risk management originates above all from the farm, but it is also true that an increasingly important role is now played by insurance instruments (Glauber, 2015).

Agricultural insurance is particularly developed in the United States and Canada, although problems related to how to stimulate the demand for insurance are not absent, less so in Europe, even though the attention paid to this issue in recent years has undoubtedly been increasing. The insurance system in agriculture is really diversified in Europe: different types of instruments and public intervention measures characterize the European scenario (Goodwin, 2001).

A particular interest is nowadays expressed by the national and international markets to the development of index-linked policies, which can expand the offer of insurance coverage for agricultural comparison, to the producer to protect himself against damage generated not only by temporary and sudden adverse weather conditions but also from the unfavorable trend, in a certain period and in more or less extensive area of specific climatic factors that negatively affect agricultural production.

Conclusions

The need to create low-impact agricultural production on the environment has led to development of new types of regenerative farms compliant with the eco-system.

The best agricultural practices safeguard the ecosystem biodiversity by considering the farm itself an ecosystem.

Combining several modern techniques some systems successfully focus on regeneration, such as biodynamic agriculture, holistic management, keyline and/or permaculture. Regenerative farmers are able to develop crops of higher quality and obtain sustainable remuneration also from an economic point of view. Obviously, running an agricultural business means facing a plurality of risks. Agriculture has always been considered a particularly risky sector. The risk of production, or yield, is peculiar since production in agriculture, more than in other sectors, takes time and depends on natural conditions and events.

In recent years, the insurance sector has developed modern policies related to climatic events which will be discussed in the following subchapters.

KEY TERMS

Biodiversity, biodynamic agriculture, GMOs, green revolution, holistic management, keyline, permaculture, regenerative farmers, sustainable agriculture.

SUBCHAPTER SUMMARY

In recent years, some forms of agricultural production alternatives to monocultures and industrial ones have been developed to promote environmental and social sustainability.

These forms of production, although very different from each other, have common characteristics in attracting particular attention to biodiversity in order to ensure the survival of the ecosystem, including soil fertility, pest and disease control, efficiency in use of water and pollination.

EEA (1998) has suggested the adoption of indicators that can represent a specific environmental matrix (Driving forces, Pressure, State, Impact and Response) to create an integrated approach to monitor the state of the environment.

Innovative techniques are proposed towards ecological agriculture. This type of agriculture uses production methods that can guarantee the conservation of natural resources and consequently natural products for the final market. These cultivation techniques are based on the fact that the farm is itself an ecosystem and

therefore is managed respecting the entire cycle of nature: starting from the soil but also from the organisms present in it.

The main objective is to safeguard the biodiversity of nature which favors environmental sustainability with crops and livestock breeding according to techniques with low impact on ecosystems.

The farmer has a holistic vision of his company that combines ecological, social and economic wellbeing. Some best practices in regenerative agriculture will be described in subsequent subchapters.

TEACHING METHODS

- lectures,
- workshops,
- open group discussions,
- student presentations,
- gamification.

DISCUSSION QUESTIONS

1. What is regenerative agriculture?
2. Is regenerative agriculture economically profitable?
3. What are the main risks that agriculture has to bear?
4. How can insurance sector contribute to the development of the new regenerative agriculture?

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3.4. The framework for sustainable tourism development

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LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- argue the necessity for sustainable development and list some open questions about it,
- define the concept of sustainable tourism development,
- describe the importance of common-pool resources management in tourism,
- describe the concept of carrying capacity in tourism development,
- describe the concept of tourist destination's life cycle,
- describe the importance of setting the Code of ethics for sustainable tourism development,
- describe the importance of certification for sustainable tourism development,

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- describe the importance of indicators for the assessment of sustainable tourism development,
- describe the importance of ecological footprint for sustainable development of tourism,
- differentiate among various types of tourists and their impacts on tourism development,
- differentiate among various types of sustainable tourism,
- describe the importance of tourism policy for sustainable tourism development,
- quote the sustainable strategies and tactics for sustainable tourism implementation at destinations,
- understand the sustainable tourism development prospects.

Introduction

As already discussed in the Subchapter on unsustainable global tourism trends, in the second part of the twentieth century an increasing number of people started to perceive holidays as integral and necessary parts of their lives. Their perceptions have been stimulated by various factors of global economic and technological development. The consequential effects were apparent in the forms of tourism that have passed over the acceptable economic, environmental, and social borders. Appeals upon sustainable development in the world were passed on to the tourism industry.

The global debates on sustainable development of tourism started to stress the importance of better planning and management of tourist destinations and showing more concern and respect for destinations' environment and host community. Mass tourism studies (e.g., Cohen, 1984; Cooper & Ozdil, 1992; Graham & Cohen, 1991; Krippendorf, 1984; Shaw & Williams, 1994, cited after Mihalic, 2020; UNWTO, 2018) significantly contributed to the development of ethical and sustainable tourism thinking. The dissatisfaction with mass tourism, due to its volume and magnitude pressures, the seasonal nature of its employment, its non-local orientation of administration and leakage of money out of the local economy, triggered these new ways of thinking about tourism and its practices. However, until the 1992 UN Earth Summit in Rio (UN, 1992), governments

slowly addressed sustainable development in the travel and tourism industry. Agenda 21, a vital document of this Summit, brought the focus of tourism sustainability implementation at the destination level. The principles of Agenda 21 were reaffirmed at Rio+20 (UN, 2012), stressing the “whole of destination” sustainable management and the need for all stakeholders to be involved in this process (governments, local authorities, citizens of destinations, non-governmental organizations, and private sector).

Agenda 21 from Rio Earth Summit guided the World Conference on Sustainable Tourism in Spain in 1995. The principles and objectives of sustainable tourism were defined (cf. World Charter for Sustainable Tourism +20, 2015). They were founded on the general and key direction: to achieve sustainable travel and tourism industry, its development should be economically viable, ecologically bearable, and socially equitable for local communities. Each travel and tourism industry sector must follow the specific directions from various sustainable development goals to achieve this direction. All stakeholders at different levels – local, regional, national, and international – should strive to achieve this common goal for a better world for future generations. COVID-19 pandemic has limited us in mobility. Hopefully, it will give us enough time for thinking about requisite changes in our attitudes and hierarchy of needs.

The sustainability and development

Sustainable development of societies

At the end of the twentieth century, “sustainable development” or “sustainability” became an increasingly crucial societal norm for human development worldwide. The call for a new, more system-oriented development paradigm originated from: (1) the growing awareness that the natural environment was being transformed on a global and historically unprecedented scale, as well as from (2) socioeconomic issues related to poverty, and (3) worry about a healthy future for humankind (Wironen, 2007). This new paradigm started to evolve parallel to the neoliberal development paradigm, where economic growth was seen as the key to well-being. Since the evidence grew that economic growth did not automatically improve people’s lives, either within nations or internationally, the existing notions of “progress”, “growth”, and “development” were challenged (Du Pisani, 2006). The sustainable development paradigm arose as an alternative to the neo-liberal development paradigm that offered a way forward

for both environmentalists fearful of a global ecological crisis and those in the development community searching for an alternative to the contemporary paradigm (Wironen, 2007). The central concept in this new paradigm is sustainability that was taken for granted in the past since the slow pace of environmental change seemed to leave plenty of time for evasion of any potential threat to the survival of human society. However, as the rate of change in a system began to approach a speed rate that threatened the ability to respond, a system became endangered with the possibility of losing both its viability and sustainability (Bossel, 1999).

The foundations of sustainable development arise from the idea that societies must change their development priorities from only economic ones towards the social and environmental questions. According to Brundtland's report (World Commission on Environment and Development [WCED], 1987), sustainable development is defined as "the development that meets the needs of the present without compromising the ability of the future generations to meet their own needs". It proposes "qualitative growth" through inter- and intra-generational balance of welfare. It can be described as any increase in quality of life (related to the health of the economy (full employment, stable prices, stable balance of payments and growth) and subjective well-being) that can be achieved with less pressure on the environment and society. Sustainable development is continued economic growth made more environmentally sensitive to raise living standards and break the link between poverty and environmental degradation (Drexhage & Murphy, 2010). The goals of sustainable development strategies are related to balanced management of all resources to increase long-term wealth and well-being. The primary assumption of sustainable development is the participation and responsibilities of individuals in the process of development while building their consciousness about the present and the future.

Since the Brundtland report in 1987 and the Rio Summit in 1992, the concept of sustainable development has made a transition to a concept that now enjoys widespread, but not universal, support. The concept of sustainable development has been adopted as a policy goal by many institutions, governments, businesses, and civil society. Its malleability allows it to be flexible, dynamic, evolving, and applicable to various situations across space and time. Its flexibility allows agents at various levels and institutions to reinterpret it for their particular situation (Kates, Parris, & Leiserowitz, 2005). While this may be seen as a strength, it can also be a liability because its numerous interpretations and usages have led to compromised implementation (Drexhage & Murphy, 2010). According to Kates et al. (2005), it represents a compromise between growth and conservation

and could be called an oxymoron: fundamentally contradictory and irreconcilable. Du Pisani (2006) points out that sustainable development is an inherently contradictory term because you cannot have both genuine development and genuine sustainability. Some authors question if sustainable development should continue to support economic growth at all, given the physical limits of the global ecosystem, and the others argue that sustainable development should particularly address required lifestyle, consumption, and behavioral changes (Drexhage & Murphy, 2010; Gadotti, 2004; Hopwood, Mellor, & O'Brien, 2005). Numerous authors criticize the increasing numbers of businesses that misuse the concept of greenwashing practices. However, despite all these doubts and critics of this concept, one could argue that in the era of frequent global crises and the loss of faith in the pure economic growth model, sustainable development might be the only effective framework and tool to address the core requisite structural challenges of global economy and society. Various international reports (e.g., UNEP, 2011, 2016; UNEP & WTO, 2012) focus on how the world can transform into a more equitable global economy that allows for scaled-up economic growth. The reports predict that greater efficiencies in the usage of resources will bring benefits to society at large.

Sustainable tourism development

Concerns with the negative impacts of tourism can be traced back to the 1960s, when they were often related to the concept of carrying capacity. In 1992 at the UN Conference on Environment and Development, the term “sustainable tourism development” was introduced first in the Agenda 21. However, only in 2005, with the report “Making Tourism More Sustainable – A Guide for Policy Makers” (UNEP & WTO, 2005) the concept gained full institutional attention. The objective of sustainable tourism development is to influence (1) the health of the destination economy, (2) the subjective well-being of local inhabitants, (3) unspoiled nature, (4) protection of resources, (5) local culture, and (6) optimum satisfaction of guest requirements in such a way that no one predominates, ensuring that interplay of these factors become more beneficial and less burdensome (France, 1997). Environmentally and socially compatible tourism means establishing a balance with economic goals to maximize the positive relationships between all three dimensions while keeping the negative repercussions. The concept of sustainable tourism development means upgrading social and environmental interests and a comparative downgrading of purely economic ones. Several characteristics can define it: various actors should participate in tourism

development, it should strive for conservation of the natural and cultural heritage with cooperation, planning and management, the satisfaction of tourists and preservation of destinations should be determined together with local communities, it should be integrated into local economic development, it should improve the quality of life, promote alternative forms of tourism, compatible with sustainable principles and the awareness of the urge of sustainable development should be promoted among all involved in tourism.

Numerous principles, theories, and suggestions have been framed as to how the desired situation can be achieved (Epler Wood, 2017; Fennel & Cooper, 2020; France, 1997). Their joint appeal is that tourism development should be supervised and controlled to preserve destinations as a viable economic, social, and natural environment. Tourism development should be economically productive, socially responsible, and environmentally conscious. The host population should decide on and participate in all matters relevant to the development of tourism. Local authorities should be prepared to cease pursuing further tourism development if it leads to an intolerable burden for the local population and environment. The pitfalls of economic imperatives should be avoided. Tourism development targets in destinations should be determined in a binding way, limiting them to what is desirable and not what is feasible. Strategic planning and land use policy should be pursued. Carefully considered zoning policies limit new constructions. Selling the land to non-locals should be based on a deliberate long-term strategy that adheres to a balanced development of economic, social, and environmental aspects of destinations. The utilization of the existing buildings and infrastructure should be promoted and encouraged. The infrastructural development policies should be based on restraint. Nature and landscape should be protected effectively. In addition to careful land management and conservative infrastructural development, large nature reserves should be created to preserve valuable ecosystems. The participation of environmentalists and nature conservation experts in all planning and construction activities should be assured. Also, the danger of one-sided economic development and over-dependence on the tourist trade should be countered. The strengthening of agriculture and small-scale trade and their partnership with tourism should be supported. Countries should strive for a qualitative improvement of jobs in tourism and continually explore all possibilities for creating new jobs in tourism-related sectors. The critical principle of tourism development should be to observe and foster destinations' natural and cultural characteristics. It must be expected that tourists are prepared to accept this principle. A desire that local cultures remain independent and alive should be supported. Local architecture, handicrafts, art, language,

customs, and cuisine should be protected and promoted. The information for all concerned – the local population, the tour operators, politicians, and tourists – should be provided, striving to win their support for socially responsible and environmentally conscious behavior. All tourism marketing tools and general information channels should promote the concept of sustainable tourism development.

Concepts and tools for sustainable tourism development

Several concepts, guidelines and tools help explain how to use and manage resources in economically, socially, and ecologically responsible ways in the tourism industry. They also help to understand the limits of the usage of these resources.

The first concept discusses the common pool resources (CPR), characterized as resources for which the exclusion of users is difficult, and the use of such a resource by one user decreases resource benefits for other users (Heikkilä & Carter, 2022). These characteristics create management vulnerabilities that can result in resource degradation, often referred to as the “tragedy of the commons” (Hardin, 1968).

Tourism impacts often result from the fact that many of the resources which the industry’s success depends upon are common-pool resources, such as beaches, mountains, and forests, that often are not managed by some regulatory authority and can be used free of charge. “Free riders” can reap their benefits without putting anything back into the maintenance of the resources. Therefore, they tend to be overused, which leads to the diminished quality of the resource base and quality of the tourist’s experience. Here, the roles of different institutions are critical factors that determine the success or failure of resource management efforts.

The second concept – carrying capacity – is used for determining the upper limits in tourism development and visitor use and herewith the optimal utilization of tourism resources. Most models of carrying capacities in tourism development refer to ecological and spatial (natural), ecological and sociological (socio-cultural) environments. According to McMinn (1997), environmental or ecological carrying capacity is the degree to which an ecosystem, habitat or landscape can accommodate the various impacts of tourism and its associated infrastructure without damage being caused. The cultural and social carrying capacity is

the level beyond which tourism development and visitor numbers adversely affect local communities and their ways of life. However, in the context of overtourism, psychological carrying capacities (cf. Innerhofer et al., 2019; Muler Gonzalez, Coromina, & Gali, 2018, cited after Mihalic, 2020) seem to be of particular significance. Psychological carrying capacity is both, the maximum levels of overcrowding that visitors are willing to accept and the maximum levels of tourism and its (negative) impacts that residents are willing to accept. One of the major problems in assessing carrying capacity is determining the specific indicators used to measure limits of acceptable and unacceptable use (McMinn, 1997). While some environmental elements are easy to measure, other elements, particularly those associated with the social environment, are challenging. Also, tourist sites are likely to have many different factors, all with their respective carrying capacities (Fennel & Cooper, 2020). Such factors have different values attached to them depending on the elements and the person making the judgement. The most widely used application of the carrying capacity concept in tourism studies is the tourist area life cycle model, developed by Butler (1980). He argued that increases in tourist numbers to a destination over time could lead to eventual decreases if the carrying capacity of the destination is exceeded. Characteristics of overuse of destinations include lack of investment in facilities that need upgrading, changes in the types of tourists as prices drop, and investment in new properties outside a destination. According to Butler (1980) a destination is going through four phases within its life cycle: 1) emerging, with minor investment in local tourism infrastructure, informality in tourism offerings, low number of visitors, local residents, who are welcoming visitors and living a life that is similar to periods before tourists arrived, 2) partially developed, with increasing investment in local tourism infrastructure, a medium number of visitors, lack of tourism regulations and residents, who partly strive to get a piece from the tourism pie or have doubts about the process of tourism development, 3) highly developed, becoming crowded with travelers, particularly in high seasons, with a heavy amount of tourism infrastructure, increasing competition for land, high energy demands, inflation of prices that pushes local residents out of the areas, inner tourism core unattractive to higher-paying visitors, numerous small shops with the same goods, ineffective or absent essential services and residents that are more and more unsatisfied with the life within the destination, 4) overdeveloped, with tourism areas that are characterized by large-scale expansion and poorly planned use of landscape, with eroded beaches, declining land and room prices in the original core areas, with luxury sites moving away from the core destination to outlying areas, with environmental contamination, with residents resentful to tourists and with trivializing or disappearing local cultures.

Forsyth (1995), in his survey, found that tour operators feel a lack of responsibility in implementing sustainable tourism. Mainly this responsibility was ascribed to host governments. The self-interest of host destinations should lead to access to foreign lands and utilization of a common pool of resources. According to Buckley (2012), the tourism industry typically chooses self-regulation over governmental regulation, codes of ethics could represent guidelines for sustainable tourism development. Code of ethics is said to be one of the essential expressions of an organization's philosophy. It serves three general aims: 1) to establish the moral values in the organization, 2) to communicate the organization's expectations to its members, and 3) to demonstrate to members and the public that the organization operates within specific ethical parameters. However, codes of ethics are considered as a possible soft helpful guideline towards sustainable tourism. Apart from it, some more substantial operational guidance for implementing the sustainability agenda in the tourism industry is requisite.

Certification in tourism could be listed among such stronger guidelines. By certification schemes, the responsibility of tourism sustainability is transferred not only to destinations but can be implemented by tour operators as well. Conscious tourists increasingly select tour operators that have adopted certification schemes that assure compliance of their services with given standards. Use of the certification label indicates that compliance with specific standards has been verified and is controlled by the standard-setting body. Standards could be environmental, organic, labor, social and normative (Piper & Yeo, 2011). In tourism, the Global Sustainable Tourism Council (GSTC) acts as the main global institution in the certification of various types of tourism operations. Assessment of satisfying the criteria for certification can be made according to several parameters, for example (Fennel & Cooper, 2020): physical-biological parameters (evaluation of the interaction between the tourism company and the surrounding natural world), parameters of infrastructure and services (evaluating the management policies and operations of the company along with its use of infrastructure), parameters of external clients (evaluating the interaction between the tourism company and the surrounding natural world) and parameters of socioeconomic environment (evaluating the interaction of the company with local communities and the population in general). Several studies (e.g., Blackman & Rivera, 2011; Rivera & Leon, 2004; Vasconcelos-Vasquez et al., 2011, cited after Fennel & Cooper, 2020, pp. 127-128) found advantages and disadvantages of such certificates. Apart from certificates, eco-labels could be another guideline that provides consumers information about the environmental impact of products and services. Tourist companies that use such labels expect that this information will influence consumers' purchasing decisions.

During the years, several sets of indicators as tools for sustainable tourism development have been developed (e.g., Choi & Sirakaya, 2006; Manning, 2002). They are designed to enable the management of environmental and socio-cultural costs and to better integrate with regional planning initiatives in tourism development. Manning (2002) divided them into (1) core indicators (site protection, stress, use intensity, social impact, development control, waste management, planning process, critical ecosystems, consumer satisfaction, local satisfaction) and (2) ecosystem-specific indicators (coastal zones, mountain regions, wildlife parks, unique ecological sites, urban environments, cultural sites (built heritage and traditional communities), small islands), suggesting that sustainable tourism ought to be developed around the specific demands of different types of natural environments. Indicators have also been developed for specific sustainable tourism purposes. Choi and Sirakaya (2006) have arranged these indicators into six dimensions: economic, social, cultural, ecological, political, and technological. Ecological footprint (EF) is a quantitative measure for describing the appropriation of natural resources by humans. Tourist ecological footprint (TEF) as a tool for sustainable tourism development is defined and operationalized on several different levels (the entire industry, individual sectors, products, destinations). Hunter (2002) set the examples of contribution to total TEF according to three types of tourist zones: source area (e.g., purchases made specifically for a holiday, travel to the airport), transit area (e.g. travel in the air, food and beverages consumed during flight) and destination area (travel while on holiday, purchases made, food and beverages consumed, water consumed, waste products, energy requirements). The TEF might be assessed from different standpoints, including seasonality, individual businesses, etc. Over the years, studies on the EF in tourism have proposed additional footprint methods. Beyond the traditional TEF, they started introducing the tourism carbon footprint (TCF) and the tourism water footprint (TWF). Both tools can quantitatively assess the level of impact that tourism has on the ecosystems of specific destinations. They can estimate sustainability by measuring natural resource consumption against the ecological carrying capacity of the destination.

The concepts of common-pool resources, carrying capacity, tourist destination life cycle, and the tools, such as codes of ethics, certification schemes, labels, and indicators, support the tourism agents in setting the policy goals, planning, implementing, and controlling the sustainable development of tourism. The knowledge and understanding of these concepts and tools are the indispensable foundation for sustainable tourism policy-making and management.

Types of tourists as tourism sustainability factors

Apart from the commercial aims of those engaged in the tourism industry and the failure of host governments to see beyond the short term, it was the attitude of tourists who continued to demand traditional types of holidays in large numbers, which resulted in the continued dominance of mass tourism and created obstacles to the spread of more sustainable approaches in tourism development. Therefore, the various types of tourists influence the opportunities available to provide more sustainable forms of tourism. Classifications, devised by Cohen (1972; cited after France, 1997, pp. 4-5), are determined by the attitude of individuals towards their trip, their expectations, and the role of such an experience within their lives.

At one extreme is the small number of explorers prepared to try new, exotic, and challenging situations in which there is a degree of risk, to obtain a novel and more authentic travel experience. Such people are absorbed into different cultures with minimum impact. They are travelers who journey independently and eschew organized forms of travel. In contrast, organized mass tourists prefer the security of a familiar environment from which risk has largely been eliminated. Their experience is created for them by the holiday industry. The perceived reality of their destination is rarely a true reflection of local life but has been packaged to reduce contact with the indigenous population. There is a range of tourist types between these two extremes that vary (1) according to a preference for novelty and risk rather than security and familiarity and (2) according to a preference of organized travel in contrast to independent journeying.

Poon's (1993) classification distinguishes between old and new tourists. Old tourists with their desire to escape from work and home to a sunny destination about which they can later boast to friends and relatives (Poon, 1993), equate with mass tourists of Cohen (1972; cited after France, 1997, pp. 4-5). New tourists who search for novel experiences and wish to be independent are akin to Poon's (1993) explorers. People, whose characteristics place them towards the explorers end of the tourist spectrum, and are described as the new tourists (Poon, 1993), favor new types of tourism. It is suggested (Jarviluoma, 1992; Shaw & Williams, 1994, cited after France, 1997, p. 5) that precisely explorers as types of tourists provide more significant opportunities for sustainable development. Cohen (1972, cited after France, 1997, p. 5) affirm the relatively small numbers of explorers whose psychology dictates an adoption of Poon's new tourism.

However, Poon (1993) asserts that, ultimately, new tourists will become the norm and outnumber those who travel to traditional destinations for motivations of escape in risk-free surroundings. He also acknowledged that, in the short term, demand for traditional holidays from new markets in Eastern Europe, Asia, the Pacific, and Africa, could well delay the realization of the widespread introduction of new patterns. The rapid growth of the global tourism industry in more than 20 years before the COVID-19 pandemic, in which the number of explorers remained relatively low and those of mass tourists was high, implied inability to achieve sustainability in tourism. After the COVID-19 pandemic, the time for such new patterns of holidays are probably on the way. Hopefully, (1) the concerns for the natural environment and (2) healthier lifestyles, together with (3) a demand for “something different” of the part of those who experienced traditional “sun, sea and sand” holidays in their youth, will not be only fashion anymore, but their most profound value for the good of themselves and the other people. Suppose they will identify with these values (nature, culture, and escapism as mind-related dimensions vs. body-related dimensions of tourist motivation and consumption (sun, sea and sand holidays) (e.g., Prebensen, Skallerud, & Chen, 2010)). In that case, the growth of new types of tourism can be expected.

Paradigms and types of sustainable tourism

As already stated, increased interest in sustainable tourism development is related to the exploitative character of mass tourism, particularly in developing countries. This interest led to the emergence of new paradigms of tourism development that would minimize the environmental, social, and economic costs and maximize the benefits. During the years of research, these paradigms have been given several different labels, among them also alternative tourism. Alternative tourism was designed as an opposite development paradigm to mass tourism. It is characterized by several distinctive characteristics in the areas of accommodation, attractions, market, economic impact, and regulation (Cater, 1993; Weaver, 1993; Wheeller, 1991, cited after France, 1997, p. 16). In alternative tourism, small numbers of individual travelers are preferred to multitudinous tourists, who are often in groups. Locally provided accommodation and decision making encourage slow, controlled growth that lies well within the capacity of the host area to absorb, without damage to its culture or the natural environment. These factors contrast with the rapid pace of the large-scale tourism development, often favored by multinational companies, which overwhelms a destination and escalates costs.

Several possible types of alternative tourism have been identified; however, their clear definitions are challenging to find. Besides, there is overlap among them. Types of alternative tourism can be, for example, adventure tourism and nature tourism, community tourism and eco-tourism (France, 1997). The first three types are partly mass tourism and partly alternative tourism, whilst eco-tourism is typically alternative tourism. Adventure tourism attracts mainly types of travelers, known as explorers. It is usually resource-based, involves a physical challenge, education and contact with nature. It can be small-scale with many eco-tourism characteristics, for example, scuba-diving, canoeing, rafting or safaris. Nature tourism is an aspect of adventure tourism where the focus is upon the study and/or observation of flora, fauna and/or landscape. It tends towards the small-scale, but it can become mass, for example, in national parks. It is sometimes perceived as synonymous with eco-tourism since one of its aims is to protect natural areas. The local community runs community tourism. It can be small-scale or mass, like some heritage museums or farm tourism. Each of these alternative types of tourism has a different level of sustainability.

Later, however, the paradigm of alternative tourism has been observed as deficient (e.g., Cohen, 1987; Wheeler, 1992, cited upon France, 1997, pp. 16-17) and was replaced by the concept of responsible tourism (Wheeler, 1990). According to McLaren (2006, cited after Fennel & Cooper, 2020, pp. 17-18), responsible tourism generates more significant economic benefits for local people and host communities: (1) it involves local people in decisions about its development, (2) it makes positive contributions to the conservation of natural and cultural heritage, (3) it provides a greater understanding of local cultural, social and environmental issues, (4) it minimizes negative economic, environmental and social impacts, (5) it engenders respect between tourists and hosts and (6) builds local pride and confidence. The term “responsible” directly expresses the desired path of tourism development towards sustainability. It moves more clearly away from the negative consequences of mass tourism and overtourism compared to alternative tourism. It can be easily discussed as an appropriate paradigm of sustainable tourism development.

The aims of eco-tourism, as the greenest, responsible and most sustainable type of tourism, include ecological and socio-cultural integrity, responsibility, and sustainability. Eco-tourism is defined as “travel with a primary interest in the natural history of a destination” (Edgell, 2016). It emphasizes learning, conservation, local participation/benefits and ethical planning, development, and management. Eco-tourists have a high tolerance for the inconveniences of remote travel, tour operators, however, focus the eco-holidays on flora, fauna, land-

scape, native culture, archaeology, and sport. Eco-tourism is non-consumptive and therefore different from other broader nature-based forms of tourism (e.g., hunting, fishing, mountaineering, surfing, diving, wildlife tourism, etc.). Unfortunately, eco-tourism often does not mean eco-tourism in practice. Many tourist providers only partially align with the principles of sustainable tourism, and the signs of “greenwashing” can be found in their tourist offerings.

Tourism policy as a framework for sustainable tourism development

The role of government for sustainable tourism development is essential because the sector is fragmented, and a leadership/coordination role is needed. Additional vital reasons for the importance of government involvement in sustainable tourism development are the need for public funding for sustainability initiatives, public ownership of many vulnerable elements of destinations, and the government’s mandate to regulate, plan and legislate (Fennel & Cooper, 2020). The latter is related to the determination of tourism policy as a long-term macro-level instrument, showing the government’s intention and providing a clear sense of direction for the tourism sector. The tourism policy can be defined as conscription of actions, carried out under the coordination of public administrations to achieve goals in the processes of analysis, attraction, reception, and evaluation of the impacts of tourism flows in a tourism system or destination. The key aims of tourism policy are to create competitive destinations, ensure that the tourism sector functions efficiently, and deliver benefits, including income and employment. Comprehensive contemporary tourism policy addresses the aspects of sustainability and serves as a basis for local authorities’ strategies and tactics for sustainable tourism realization.

Based on several research studies, UNWTO (2018) proposed policy recommendations to combat overtourism. Local authorities should set a long-term strategic plan for sustainable tourism, including defining the carrying capacity for the destination and specific areas and attractions. This is particularly useful for implementing strategies that aim at dispersal of visitors, visitor segmentation, and more effective development of new itineraries and attractions. The governance models that engage administrations at all levels, the private sector and local communities should be set. Mechanisms to foster communication and collaboration among all relevant stakeholders should be implemented. The integration of

local communities in the tourism value chain, promoting their engagement in the sector and ensuring that tourism translates into wealth creation and decent jobs should be enhanced.

The perceptions of local communities towards tourism should be regularly monitored, and the value of tourism should be promoted among them. Important are evidence-based decisions and planning of critical issues such as carrying capacity, mobility, and natural and cultural resources management. If possible, local communities should invest in technology, innovation, and partnerships to diversify demand in time and space and attract adequate visitor segments according to their long-term vision and strategy. The plans should be made by methodologies such as strategic foresight and scenario planning. The contemporary dynamic, volatile, uncertain, and complex global developments require an approach that considers the past and identifies the driving forces of change and critical uncertainties.

Strategies and tactics for sustainable tourism implementation

The UNWTO (n.d.) defines a destination as a physical space where visitors spend at least one night. It includes tourism products such as support services and attractions, and tourist resources. It has physical and administrative boundaries defining its management and images and perceptions defining its market competitiveness. Destination incorporates various stakeholders and can be of any scale, from a whole country, a region, an island, a village, a town, to a city. According to the European Charter for Sustainable Tourism in Protected Areas (Europarc Federation, 2010), a sustainable destination (1) protects the natural and cultural heritage, (2) includes all stakeholders in its sustainable development, (3) is effective in partnership working, (4) plans and implements sustainable tourism strategy and action plan, including monitoring and evaluating, and (5) realizes the environmental, social, and economic benefits of everyone working more sustainably.

Several characteristics of a destination influence the intensity of tourism impacts: the size of the destination, scale and rate of tourism development and numbers of tourists, fragility and sensitivity of the landscape, flora and fauna, the political environment of a destination, the sensitivity of development concerning the local environment and culture, development incentives, social and

cultural attitudes of the local people, types of tourists, competition of other areas/destinations, accessibility, degree of foreign ownership, employment of non-indigenous labor, government provision of infrastructure, nature and attractiveness of tourist facilities, level of economic development of the area, rural or urban type of the region etc. (Ryan, 1991; Shaw & Williams, 1994).

The destination is managed by Destination Management Organizations (DMOs) that hold the key to the future of tourist destinations. Within their management processes, they must consider that destinations are subject to cycles, which require different steps in sustainable destination management. DMOs, in consultation with the private sector and civil society, must set goals to ensure that they can measure the evolution of a destination. Each destination requires a strategic plan that should be frequently updated. A tourism life cycle is a tool that helps managers to develop strategies for a destination to avoid its falling into decline. It can be a predictive model that guides innovation and the diversification of tourism product development (Epler Wood, 2017). DMOs, citizens and national governments must anticipate the threats of overdeveloping vulnerable tourist destinations. Steps must be taken to protect valuable landscapes, ecosystems, cultures, and local attractions before the value of a destination is compromised, often for generations. Unless this is done, there comes an inevitable point when the destination becomes saturated and reaches overdevelopment with its consequent devaluation.

Several tactics can help DMOs, citizens and governments to realize the sustainable strategy (France, 1997): planning and management, encouraging alternative economic activities through policy measures, arranging the education and training for local people, setting the restrictions on expatriate labor, planning to agree on the capacity levels, educating all actors in tourism, including local people and tourists, drawing common interests, establishing continuing dialogue, and optimizing, not maximizing. All stakeholders of the destination's development should collaborate and encourage the dispersion of visitors within the destination and beyond it, suggesting a visit to less known areas. They should promote tourism in different periods (for example out of the season), create new and different itineraries and tourist attractions, review and improve regulations, such as closing some overcrowded areas to traffic or limiting the number of visitors, attract more responsible types of travelers, ensure the benefits of tourism to local communities, for example by increasing the number of inhabitants employed in tourism, and by involving residents in the creation of tourism experiences (e.g., Korez Vide, 2013a, 2013b), develop and promote experiences in the city or territory that benefit both tourists and residents, increase the infrastructure and services of

the resort, involve the local community in tourist decisions and choices, develop tourist practices that support circular economy (e.g., Falcone, 2019; Rodríguez, Florido, & Jacob, 2020; Sørensen & Bærenholdt, 2020), communicate with compelling stories (e.g. Korez Vide, 2017), educate travelers and tell them how to be more responsible and respectful of the place and monitor and measure changes (UNWTO, 2018). Apart from suggestions for tourism sustainability, solutions for sustainable travel have been studied, as well (Sheivachman, 2019).

Tour operators should strive for brand loyalty through repeat business that leads to economic success and profitability, which can be achieved by the provision of a good value holiday, education of the consumer, particularly the provision of adequate and accurate information about the holiday and the destination prior to the visit, as well as agreed structures for development with all interests at the destination to provide a harmonious and appropriate tourist product (France, 1997). Tourist destinations' sustainable or green marketing strategies, performed by DMOs and tour operators, should be based on an organization basis that avoids possible accusations of greenwashing and proves the provision of responsible tourism (e.g., Font & McCabe, 2017).

Tourists should experience an enjoyable holiday by providing (1) an environment suited to the psychographic profile of individuals, (2) a good value holiday with no evident over-exploitation of destination and (3) the proper education to facilitate the right choice of holiday, maximum knowledge and therefore a more accurate expectation of the destination. In this way, the maximum enjoyment of tourists can be achieved with limited stress/uncertainty/risk (France, 1997).

UNWTO (2021) proposed 11 strategies with specific measures to address visitors' numbers at destinations:

1. Promotion of the dispersal of visitors within the destination and beyond (e.g., host more events, develop and promote visitor attractions and facilities in less-visited parts of the destination and its surroundings, improve the capacity of and time spent at attractions, create a joint identity of a destination and its surroundings, implement travel card for unlimited local travel, mark the entire city as inner-city to stimulate visitation of less-visited parts).
2. Promotion of time-based dispersal of visitors (e.g., promote experiences during off-peak months, promote dynamic pricing, stimulate events in off-peak months, set timeslots for popular attractions and/or events aided by real-time monitoring, use new technologies (apps and others) to stimulate dynamic time-based dispersal).

3. Stimulation of new visitor itineraries and attractions (e.g., promote new itineraries at the city entry points and through the visitor's journey, offer combined discounts for new itineraries and attractions, produce city guides and books highlighting hidden treasures, create dynamic experiences and routes for niche visitors, stimulate the development of guided tours through less-visited parts of the city, develop virtual reality applications to famous sites and attractions to complement onsite visits).
4. Review and adaptation of regulation (e.g., review opening times of visitor attractions, review regulation on access for large groups to popular attractions, review regulation on traffic in busy parts of the city, ensure visitors use parking facilities at the edge of the city, create specific drop-off zones for coaches in suitable places, create pedestrian-only zones, review regulation and taxation on new platform tourism services, review regulation and taxation on hotels and other accommodation, define the carrying capacity of the city and critical areas and attractions, etc., consider an operator's license system to monitor all operators, etc., review regulation on access to certain areas of the city for tourist related-activities;
5. Enhancement of visitors' segmentation (e.g., identify and target visitor segments with lower impact according to the specific city context and objectives, target repeat-visitors, discourage visitation of the city by certain visitors' segments).
6. Assurance of benefits from tourism to local communities (e.g., increase the level of employment in tourism and strive to create decent jobs, promote the positive impacts of tourism, create awareness and knowledge of the sector amongst local communities, engage local communities in the development of new tourism products, conduct an analysis of the supply-demand potential of the local communities and promote their integration in the tourism value chain, improve quality of infrastructure and services considering residents and visitors, stimulate the development of impoverished neighborhoods through tourism).
7. Creation of city experiences that benefit both residents and visitors (e.g., develop the city to fit with the residents' needs and desires and consider tourists as temporary residents, develop tourism experiences and products that promote the engagement of residents and visitors, integrate visitor facilities within local festivities and activities, create and promote local city ambassadors, promote art and culture initiatives such as street art to provide fresh perspectives on the city and expand visitation to new areas, extend opening times of visitor attractions).

8. Improvement of city infrastructure and facilities (e.g., create a city-wide plan for a well-balanced, sustainable traffic management, ensure that significant routes are suitable for extensive tourism activity and that secondary routes are available at peak times, improve urban cultural infrastructure, improve directional signs, interpretation materials and notices, make public transport better suited for visitors, set up specific transport facilities for visitors during peak periods, provide adequate public facilities, create safe cycling routes and stimulate bicycle rentals, set up specific safe and attractive walking routes, ensure that routes are suitable for the physically impaired or elderly visitors in line with accessible tourism principles, safeguard quality of cultural heritage and attractions, ensure cleaning regimes fit with tourism facilities and with peak times).
9. Communication with and engagement of local stakeholders (e.g., ensure that a tourism management group is set up and is regularly convened, organize professional development programs for partners etc., organize local discussion platforms for residents, conduct regular research among residents and other local stakeholders, encourage locals to share interesting content about their city on social media, communicate with residents about their behavior, unite disjointed communities).
10. Communication with and engagement of visitors (e.g., create awareness of tourism impact amongst visitors, educate visitors on local values, traditions and regulations, provide adequate information about traffic restrictions, parking facilities, fees, shuttle bus services, etc.).
11. Deployment of monitoring and response measures (e.g., monitor key indicators such as seasonal fluctuations in demand, arrivals and expenditures, patterns of visitation to attractions, visitor segments, etc., advance the use of big data and new technologies to monitor and evaluate tourism performance and impact, create contingency plans for peak periods and emergency situations).

The enhanced tourism planning and visitor management techniques, as well as the clear agenda to involve local communities in the future of their destinations, have become an urge (Fennel & Cooper, 2020). A well-planned and managed destination will hold value much longer. In this context, it is significant how investments in tourist products and maintenance are made (Epler Wood, 2017). For this purpose, new systems of tourism's assets valuation are required. This is the basis to attract financing through various sources, which is essential for destinations to hold value in the long term, avoid decline and generate benefits for local people and ecosystems.

Sustainable tourism practice – the green scheme of Slovenian tourism³⁰

The Green Scheme of Slovenian Tourism (GSST) is a national certification program that under the brand SLOVENIA GREEN supports the development of sustainable tourism in Slovenia. The program offers to Slovenian destinations and service providers the tools to evaluate and improve their sustainability endeavors. At the same time, it promotes these green endeavors through the SLOVENIA GREEN brand. The scheme's strategic guidelines align with sustainable development and demonstrate concern for the economic, social, cultural, and natural environment. Slovenian Tourist Board (STO) manages and develops the scheme, offers educational support, and establishes promotional channels in the international tourism market to promote SLOVENIA GREEN destinations and service providers. Association for Sustainable Tourism "GoodPlace" is an accredited partner that assesses the sustainability of destinations and service providers using the Green Destinations Standard. Destinations and service providers are closely connected. The destination motivates service providers to operate sustainably and strive for eco-labels since a green destination can only be credible if it has a critical mass of certified service providers.

The GSST is based on the European Tourism Indicators System (ETIS) and on the global criteria of the Green Destinations Standard (GDS), awarded by the Global Sustainable Tourism Council (GSTC), which therefore also applies to SLOVENIA GREEN. The instructions for acquiring the SLOVENIA GREEN label state that destinations are evaluated according to the GDS global criteria, and operators who join the GSST must have one of ten international labels, which SLOVENIA GREEN also recognizes. Parks can join with a supporting label or as destinations. Destinations can obtain the SLOVENIA GREEN destination label by applying and completing an eleven-step process: appointment of a green coordinator, forming a green team, raising awareness, signing the Green Policy for Slovenian Tourism, conducting surveys, collecting data, issuing reports and requests JOINING THE GSST for assessment, drawing up action plans, defining the local character and green DNA, issuing requests for field visits, implementing measures and re-assessing if their activities comply with stated standards after no more than three years. Depending on their criteria fulfilment level, destinations can be awarded the label SLOVENIA GREEN Destination Bronze, SLOVENIA GREEN Destination Silver, SLOVENIA GREEN

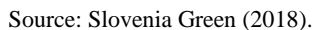
³⁰ Adapted upon STO (2018) and Sustainability Leaders Project (n.d.).

Destination Gold, and SLOVENIA GREEN Destination Platinum for the highest level of fulfilment of the criteria. To receive a Gold or Platinum label, the destination must also have at least one accommodation provider with the SLOVENIA GREEN Accommodation label. As described below, Parks can receive the SLOVENIA GREEN Park label or become destinations as described above, or operators with supporting labels. Operators can obtain the SLOVENIA GREEN Accommodation, SLOVENIA GREEN Travel Agency, SLOVENIA GREEN Attraction and SLOVENIA GREEN Cuisine labels based on a supporting label; in addition to a completed application and signed Green Policy for Slovenian Tourism document, applicants must enclose proof of receipt of one of the international labels recognized by the GSST. To make it easier to carry out the procedure of joining the GSST, STO provides destinations and operators with the Manual on Obtaining, Maintaining and Renewal of the Slovenia Green Label, the Rules on Obtaining, Maintaining and Renewal of the Slovenia Green Label, which covers the entire procedure for obtaining the SLOVENIA GREEN label. They can also be provided with the Guidelines for the Development of Green Tourism Products, Handbook for Hotels for the Development of Sustainable Business Models and Handbook for Marketing the Slovenia Green Label and Destinations.

The cost of joining the GSST (registration, sustainability evaluation and awarding of Slovenia Green label) for destinations is EUR 1,220 + VAT. The cost of maintaining the label for the first and the second year after joining the GSST is EUR 200 + VAT. The cost of renewal of the label every third year for destinations is EUR 920 + VAT. The cost of joining the GSST (registration and awarding of Slovenia Green label) for tour operators is EUR 150 + VAT, which is a one-off cost that the tour operator pays upon joining.

There are several benefits for SLOVENIA GREEN members. The scheme increases the visibility of destinations, accommodation providers, travel agencies or parks and increases the level of promotion they receive through national and international channels. The STO plans and implements promotional activities to support sustainability efforts in the project of included destinations, service providers and parks. In the process of joining the GSST, the destinations and service providers sign the Green Policy of Slovenian Tourism, which is based on ten sustainability principles. The Green Policy of Slovenian Tourism sets out the fundamental commitment of Slovenian tourism to operate according to sustainability principles and make continuous efforts to improve. Restaurants which join in sign the Commitment to sustainable Slovenian gastronomy. In June 2016, the STB and 18 contractual partners (destinations and tour operators) formed the

Figure 3.20. Members of GSST



Apart from the unknown consequences of global health, economic and social crisis, the unpredictability relates to several other factors as well. For example, in the future, there is uncertainty about just how active the ageing population could be in terms of travel and whether the social security changes in various countries will allow resources to travel. However, in terms of ageing trends in developed countries, it could be expected that the retirees might still be a privi-

leged tourist segment, mainly due to their budget. Additionally, it can be expected that the younger generations will shape sustainable tourism future (Fennel & Cooper, 2020). Generations X, Y and Z – the Millennials – will remain in the youth market longer as they continue with their youth lifestyle and settle down later. This trend changes the nature of the traditional nuclear family household and will impact the future sustainability approaches in this industry.

Climate is an essential resource for destinations and a critical part of the destination's economic base. Changes in climatic elements will trigger human responses in terms of demand and will, therefore, pose a threat to a destination's competitiveness, sustainability, and economic viability (Čavlek, Cooper, Krajinović, Srnec, & Zaninović, 2019). The vulnerability of a destination to climate change will depend on its exposure to climate change, the sensitivity of the tourism system and the adaptive capacity of the destination to cope with change. Destination adaptation to climate change will involve adjustments in practices, processes, or structures to take account of changing climate conditions to moderate potential threats; or to benefit from the opportunities associated with climate change (McCarthy, Canziani, Leary, Dokken, & White, 2001).

There are ongoing debates about whether virtual reality (VR) may replace the authentic travel experience one day. The COVID-19 pandemic has accelerated these discussions. With VR, the impacts of tourism are minimal: no environmental degradation, carbon emissions, no impacts on cultures or risk of disease. VR is already being used in various ways for tourism – planning and management, marketing, entertainment, education, accessibility, and heritage preservation (Guttentag, 2010). But the key question is just how easily the market will accept VR substitutes for authentic experiences.

Fennell and Cooper (2020) predict two different and divergent trends for the development of the tourism industry in the future: (1) the first one is the trend towards the use of artificially technologically enhanced destinations, such as theme parks and resorts. Such fantasy worlds are aligned with the contemporary experience economy and restructure previous parks into computer interfaces that communicate with visitors' devices; (2) the second trend is the offer of authentic, well-managed contact with nature and indigenous communities. Here eco-tourism is the obvious example.

UNWTO (2021) outlines six strategic guidelines for the responsible recovery of the tourism sector after the COVID-19 pandemic and to build better tourism: public health, social inclusion, biodiversity conservation, climate action, circular economy, as well as governance and finance. The diversity of these topics illus-

trates the major trend in the sector: recognizing the necessary coherence and cooperation between representatives of different social and economic sectors related to tourism.

Conclusions

The COVID-19 pandemic has caused an enormous decline in the travel and tourism industry and poses a significant future challenge and uncertainty for this industry. It may bring opportunities for a higher level of tourism sustainability in the long term. After requisite measures against the pandemic at the recovery path, the industry will have to think about various adaptations and innovations to satisfy the requirements of a new post-pandemic reality.

Typical mass tourism and overtourism, with all their adverse effects, have most likely come to an end with this pandemic. Hopefully, they will transform into more sustainable types of tourism. Such a transformation should be supported by the shift from short-term to long-term thinking and planning in tourism. There should gradually occur strong drivers of sustainability on the demand side since consumers will, hopefully, put more and more pressure on the industry and destination managers to behave responsibly. However, the education for conscious consumers in tourism takes time.

After this pandemic, sustainability will so much more become a requisite integral part of economies. Countries will have to become strongly committed to sustainable tourism development. If not, they will have to restructure their economies. The importance of sustainable approaches in tourism will grow in the future with more and more consumers and businesses acting and travelling responsibly.

One of the most daunting challenges for the sustainable development of the travel and tourism industry in the future is a technology development and transfer. Before COVID-19, tourism transportation produced an estimated 75% of all emissions of the tourism sector, contributing to 5% of all human-made emissions and over 20% of all transport-related emissions (UNWTO, 2019b). According to Lenzen et al. (2018), the combined emissions associated with tourism across nine industries in 2017 amounted to nearly 4.3 billion metric tons emitted per year. Therefore, the development of low-carbon tourism transportation and green infrastructure methods will be one of the most significant challenges of future sustainable tourism development.

The travel and tourism industry also lacks the means to collect timely evidence of its impact, particularly environmental impact (von der Ropp, 2020). Technologies helping to produce this evidence are therefore in high demand and could accelerate the shift towards a more sustainable industry. For example, technologies to monitor and report CO₂ emissions from the industry's operations across the value chain are necessary not only (1) to assess impact but also (2) to encourage stakeholders to set concrete and quantifiable indicators to contribute to the Sustainable Development Goals, as well as (3) to allow consumers to make informed decisions based on such data.

Additionally, inventions that will contribute to establishing a circular economy, such as those advancing resource efficiency in the value chain, could make a big difference in the travel and tourism industry. Technologies focused on the sustainable use of water, energy, and food resources and those applying the principles of reuse and recycling in plastic packaging and waste are only a few of the technical solutions the industry requires.

Apart from technological challenges, the tourism industry also faces policy and financial challenges. Many small- and medium-sized enterprises will require technical and financial support for the transition to greener operations. Therefore, the tourism industry will have to build resilience and innovativeness into its systems to be prepared for an unpredictable future.

KEY TERMS

Sustainable tourism development, carrying capacity, tourist destination's life cycle, certification in tourism, code of ethics in tourism, ecological footprint in tourism, responsible tourism, types of sustainable tourism, tourism policy.

SUBCHAPTER SUMMARY

This Subchapter conceptualizes sustainable tourism development based on various previous observations and their linkages with UN sustainable development goals. We discuss the benefits of sustainable tourism development and explain its importance for the future. We describe the key concepts, guidelines and tools for sustainable tourism development, the types of tourists and their importance for sustainable tourism development, the possible types of sustainable tourism,

the importance of tourism policy for sustainable tourism development, as well as the possible strategies and tactics for the implementation of sustainable tourism practices. The Green Scheme of Slovenian Tourism is presented as an example of sustainable tourism practice. At the end of the Subchapter, some insights into the prospects for sustainable tourism are given.

DISCUSSION QUESTIONS

1. How do you understand the importance of sustainability in tourism development?
2. Discuss the importance of tourism policy for sustainable tourism development.
3. Think of an additional (apart from stated in this Subchapter) measure that would help to prevent overcrowding at tourist destinations. Can you explain it in a practical example?
4. How would you raise the consciousness of tourists about the importance of sustainable tourism development?
5. In your opinion, how will the COVID-19 pandemic impact the tourism sustainable development path? Short-term? Long-term?

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3.5. Governance and management for a sustainable economy

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LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- understand the role of corporate governance and strategic management in implementing the concept of sustainable development of an enterprise,
- be able to apply the theoretical knowledge on corporate governance and strategic management in developing sustainable corporate and businesses strategies,
- make critical judgements on sustainable strategies in business practice based on a sound theoretical base,
- understand the role of IT in implementing a sustainable economy,
- critically assess of use of green IT in business practice based on a theoretical foundation.

Introduction

EU environmental policies and legislation (European Commission, 2015) protect natural habitats, keep air and water clean, ensure proper waste disposal, improve knowledge about toxic chemicals and help businesses move toward a sustainable economy. The EU has some of the world's highest environmental standards, developed over decades. Environment policy helps the EU economy become

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more environmentally friendly, protects Europe's natural resources, and safeguards the health and wellbeing of people living in the EU. Environmental quality is central to our health, our economy and our well-being. However, it faces several serious challenges, not least those of climate change, unsustainable consumption and production, as well as various forms of pollution. The success of the world's society will therefore in future be built on economic, social and environmental sustainability, which can be achieved by developing new technologies, business models, and social innovations, where corporate governance and "thinking ahead and in long-run" is of great importance (European Commission, 2015).

Corporate governance and management on one side and social responsibility as well as sustainable functioning of companies on the other have become more and more connected and important in assuring company's success. In order to function sustainable, the corporate governance and management holders have to implement the correct corporate values through corporate codes (codes of ethics, codes of conduct or other statements of corporate values, responsibility and corporate governance). This means that companies not only have a responsibility to stakeholders who have or represent important corporate interests, but also to others, outside their business relationships to contribute to the environment and the health, safety, and well-being of the world's society. Since corporate social responsibility and sustainable functioning expands company's accountability to wider stakeholders by reporting on their corporate socially responsible activities, it means that boards of directors are responsible for corporate social responsibility reporting and thus also for its sustainable functioning. Practical experiences show that formal implementation solely (moral commitments) is usually not enough, due to the essential purpose of company's existing (creating profit). Furthermore, searching for strategic opportunities and developing strategies is crucial for the sustainable development of an enterprise and the realization of its vision, mission, purposes, and goals. Therefore, strategic management has an essential role in a sustainable economy. In this Subchapter, we discuss strategic management as conceptualized within the MER Model of integral management. Due to space limitations, our strategic management presentation is focused on the process dimension, while only basic features of the instrumental and institutional dimensions are explained.

In a context of sustainable operation, it is also important that companies are aware of the fact that information technology (IT) has become a part of our everyday lives. IT refers to anything related to computing technology, such as networking, hardware, software, the Internet, or the people that work with these

technologies. Companies today have their own IT departments, or they have a contract with IT companies for managing the computers, networks, and other technical areas of their businesses. The goal behind most green business initiatives, including sustainable IT, is to promote environmental sustainability. Sustainable IT or the more usually used term green IT is a term used to describe the production, management, use, and disposal of IT to reduce damage to the environment. Green IT aims to minimize IT operations' negative impact on the environment by designing, manufacturing, operating and disposing of computers and computer-related products in an environmentally-friendly manner. Green IT practices' motives include reducing hazardous materials, maximizing energy efficiency during the product's lifetime, and promoting unused and outdated products' biodegradability. Newer components of green IT include the redesign of data centers and the growing popularity of artificial intelligence (AI), internet of things (IoT) and robotics.

Corporate governance

Corporate governance with the company's key stakeholders (shareholders and top management) plays an important role in ensuring the ethical, credible, and sustainable functioning of the company. Therefore, the main purpose of the presented Subchapter is to discuss corporate governance as the origin of the ethical, credible, and sustainable functioning of the companies, as well as process, institutional instrumental dimension of governance and management process in assuring sustainable functioning of the companies.

Corporate governance as the origin of corporate sustainable functioning

Due to the requirements for a holistic and integral approach to governance and management, researchers and practitioners have been working on contemporary solutions; certain efforts led to the development of integral management and governance. In this Subchapter, we argue the importance of the multi-layer integration of governance and management of a company and its environment, considering the fundamental aspirations (desires) of the company and, thus, their quantitative as well as qualitative changes. We base our arguments on both horizontal and vertical integration of a company's governance and management processes, instruments, and institutions into a consistently operating unit. The pro-

cess, instrumental and institutional integrability and integrity of the governance and management are also initial conditions for the implementation of all other integration factors and thus corporate sustainable functioning.

For companies' sustainable functioning the integration with culture (as well as with dimensions in science, philosophy, religion, ethics, art, techniques, and technology), credibility, entrepreneurial spirit, and ecology cannot be limited to a certain section of a company and/or its environment. A company's integration with its broader environment should be implemented in operational, market, and cognitive spaces of the company's functioning; they should be manifested as the company's external capability for objective, time, and spatial alignment of its potential outputs (i.e., services and products) with the needs and expectations of its environment. The integration of the company's internal factors (i.e., material as well as non-material) is manifested as its internal capability and its ability to function efficiently and achieve synergy in all crucial areas. This is the best way a company is able to satisfy the needs and expectations of its environment better than its competitors do.

Throughout the years, socially responsible behavior as well as sustainable functioning has become a kind of "signboard" for corporations hoping for a better reputation on the global market. Despite its controversial use by some recognizable corporations, for example, McDonald's, British Petroleum, etc., corporate social responsibility (CSR) and sustainability keeps, or more precisely, gains an important role in corporate governance and management. Since CSR and sustainability expands a corporation's accountability to wider stakeholders by reporting on their CSR and all other nonfinancial activities, it means that boards of directors are responsible for such corporate reporting.

Challenges for sustainable corporate governance

In the past the academic and professional literature emphasized that the key for the corporate ethical, credible, and sustainable functioning was the appropriate attitude of the corporate key stakeholders (shareholders and management) towards such behavior and functioning. However, lately the need for sustainable functioning of companies, which originates from ethical and credible behavior of companies considering and fulfilling the interests of all stakeholders, can be observed also in changes of European as well as national legislatures. This fact is of high importance while practical experiences show that only formal implementation (declaration) of such sustainable functioning and behavior is usually not

enough, due to the essential purpose of corporations (creating profit) (Primec & Belak, 2018).

The strong influence on corporate sustainable functioning can be attributed to European requirements on nonfinancial information disclosure. This requirement was transposed also into the national Slovenian legal order by the ZGD-1J draft amendment. According to the ZGD-1J draft amendment, drawn up by the Ministry of Economic Development and Technology of the Republic of Slovenia in 2016, only large companies that are public-interest entities employing more than 500 people on average, shall prepare a nonfinancial statement. Moreover, companies obliged to draw up a consolidated annual report and employing on average more than 500 people on a consolidated level, shall also be obliged to prepare a nonfinancial statement in compliance with the draft. In accordance with the new Article, 70b, of the ZGD-1, these companies shall include a nonfinancial statement in their management report. This statement contains information to the extent necessary for an understanding of the undertaking's development, performance, position, and impact of its activity, relating to, as a minimum, environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters. The above indicated information refers to the previous period of operations. Directive 2014/95/EU explicitly stipulates that small and medium-sized undertakings shall be exempt from this obligation, which is taken into consideration in the proposed ZGD-1J amendment. In light of the foregoing criteria and publicly available data of the Agency of the Republic of Slovenia for Public Legal Records and Related Services, fewer than 50 undertakings established in the territory of the Republic of Slovenia shall be obliged to prepare a nonfinancial statement (ZGD-1J, p. 7).

Disclosure of nonfinancial information represents a significant challenge to management and supervisory bodies. Corporate managers and directors are often exposed to conflicts of interest between responsibility for ensuring maximized company's value (as legal obligation to shareholder) and specific duties to society and therefore for sustainable functioning as well. For that reason, their decisions require compliance with regulation/law and cooperation with the underlying spirit of regulation/law (Primec & Belak, 2018).

Considering the above we can argue that the most important challenge for corporations in future will be not only to fulfil the legal requirements for nonfinancial reporting but to approach to such kind of reporting with all necessary seriousness. This means that corporations should in the future think of their sustainable, ethical and credible functioning seriously and therefore should approach to such

functioning in accordance with all basic management functions: such sustainable functioning of corporations should be planned, organized, managed and controlled and as such not implemented ad-hoc.

Corporate governance for development of sustainable economy

A company's sustainable functioning can be achieved only when the company is entirely committed. We argue that this commitment should take place at all hierarchical levels of the company's governance and management process. Based on the concepts of integral governance and management (Belak, Belak, & Duh, 2014; Bleicher, 2004), these levels are political or normative (shareholders), strategic (top management) and tactical/operative (or operational) management levels.

Corporate social responsibility, ethical, credible and sustainable functioning is predicated upon the idea that the functioning of a company does not have only a financial purpose, but a set of three core imperatives – economic, social and environmental – which guide decisions and activities, and which are equally valid and necessary within the business (Primec & Belak, 2018). The idea of a socially responsible, ethical, credible and sustainable corporation therefore strongly depends on the corporation's key stakeholders – owners (shareholders) and top management. It embraces the activities of ethics, credibility and sustainability initiation in a corporation's vision, its policy (defined by Duh (2018) as the mission, purposes, and fundamental goals), strategy, and, finally, in the processes and structures necessary for implementation.

Planning, organizing, directing, and controlling are defined as the basic functions of the governance and management process (Duh, 2018) in a company. They are of great importance in the whole process of the realization of the idea of a socially responsible and therefore also sustainable functioning of the company. The idea of an ethical, credible and sustainable company should be manifested by the company's owners (shareholders) in its policy, which should be based on the vision of becoming an ethical and sustainable company. Its mission, purposes and fundamental goals should be defined in accordance with its vision of an ethical, credible and therefore socially responsible and sustainable company. According to Bleicher (1994), the vision of such a company must be supported by the company's responsible and sustainable policy and philosophy, meaning that such company's policy is oriented towards fulfilling the interests of all stakeholders and not only the shareholders' interests. It should be emphasized

that the company's policy strongly depends on its owners' (and top managers') values and norms, which are expressed by enterprise culture (Belak et al., 2014; Rüegg-Stürm, 2002).

At the strategic management level (top management level) the process of planning strategies and the strategic allocation of resources take place to move towards the vision, mission and goals of becoming an ethical and sustainable company (Belak, Duh, & Štrukelj, 2010, Duh, 2018). A company's top managers hold the main responsibility for making decisions on strategies and strategic allocation of resources. It is their responsibility to find the most appropriate strategy.

For successful implementation of strategies, it is of great importance to develop an ethics and sustainability program by defining the activities and the responsible performers as well as the necessary resources for these activities. The purpose of such an ethics and sustainability program is to make strategies action-oriented. The responsibility for the implementation of this program also lies at the operational management level. Only this way can a company attain the status of socially responsible company and can obtain the sustainability in its functioning.

In order to successfully realize the planning process at all hierarchical levels, adequate planning instruments should be developed, among which planning methods, in particular, are of great importance (compare with Duh (2018), Belak et al. (2010), Belak et al. (2014)), either completely new methods or some of the existing methods could be adopted (proposed by different authors, e.g., Bleicher (2004), David (2008), Hinterhuber (2004), Wheelen & Hunger (2012)). The institutional dimension within the proposed concept of an holistic planning model describes the responsibilities of various stakeholders in an enterprise (shareholders and managers) regarding decision-making in the planning process as well as experts and other co-workers who, in accordance with the company's owners and managers, are responsible for business ethics implementation and its ethical as well as sustainable functioning (Belak et al., 2010).

Key success factors (as well as success itself) are of crucial, strategic importance for all companies. Therefore, companies should devote a great deal of their attention to these factors. They should identify and permanently try to improve them. Based on various scientific studies and knowledge, the following success factors were incorporated into the MER Model of Integral Management and Governance (Belak et al., 2014): internal and external compatibility of an enterprise, credibility, efficiency, competitiveness, entrepreneurship, synergy, culture,

philosophy, ethics and ecology. Considering all the above mentioned key success factors the functioning of the company is focused to its sustainability.

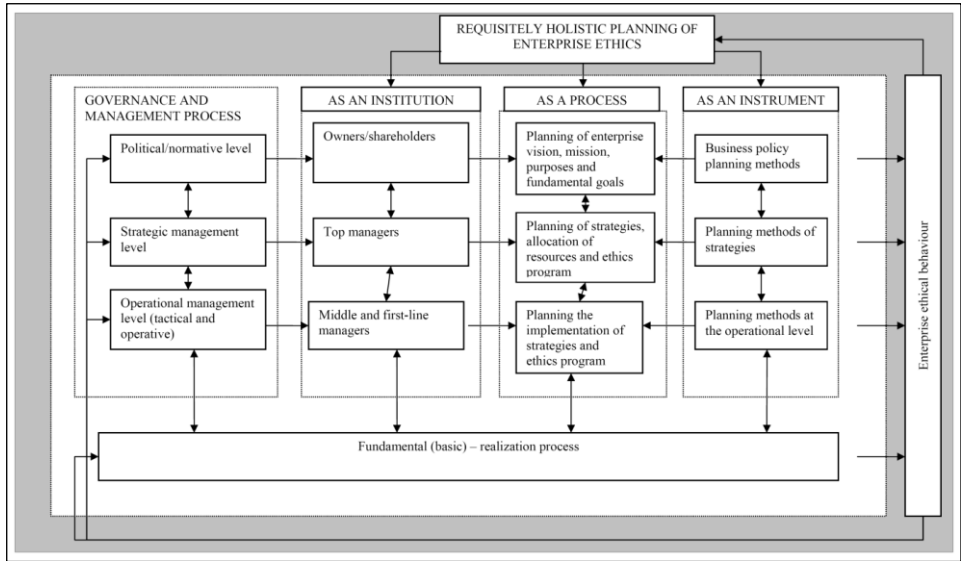
The MER model of integral management and governance therefore anticipates that the behavior of all of companies' stakeholders (i.e., owners, management, and others) should be based on credibility – that is, the honest conduct of the entire company in relation to all of its partners, always and in all circumstances. For this reason, credibility should be established and implemented mutually: on the part of the company as an institution in relation to all of its stakeholders individually and on the part of every individual stakeholder (on behalf of the given enterprise) in relation to others. Therefore for the purpose of achieving the socially responsible and sustainable functioning of a company, it must plan, organize, implement and control such implementation of the sustainability and its sustainable functioning.

Towards sustainable corporate governance: process, institutional and instrumental dimension

Planning, organizing, directing, and controlling are defined as the basic functions of governance and management process (Duh, 2018). They are of the great importance in the whole process of the realization of the idea of an ethical, credible and sustainable functioning of the company. Firstly, the idea of an ethical, credible and sustainable functioning of company should be manifested by the company's owners in its policy that is based on the vision of an ethical and sustainable company as shown in the figure bellow. Its mission, purposes and fundamental goals should be defined in accordance with its vision to be an ethical, credible and sustainable company. According to Bleicher (1994), the vision of such company must be supported by the company's responsible policy and philosophy. We should emphasize again that the company's policy strongly depend on the company's owners' (and top managers') values and norms, which are expressed by company's culture (Belak, 2014; Rüegg-Stürm, 2002).

At the strategic management level the process of planning the strategies and the strategic allocation of resources take place for realizing the vision, mission and goals of becoming an ethical, credible and sustainable enterprise. The company's top management holds the main responsibility for making decisions on strategies and strategic allocation of resources (as shown in Figure 3.21). It is top management's responsibility to find the most appropriate strategy for realization of the vision, mission, and goals to be an ethical, credible and sustainable enterprise.

Figure 3.21. The institutional, process and instrumental dimensions of governance and management process for ensuring company's sustainable functioning



Source: Based on: Belak et al. (2010).

In order to conclude we can argue that sustainable economy is possible and for the world's society needed. This can be achieved through non formal and formal measures, the awareness of the companies' key stakeholders (owners and top management) on one side and through focused EU and national legislations, which have the most impact to the behavior of the individual as well as the companies. The companies and transparent, credible corporate governance can stimulate and influence the development of the sustainable economies by the companies' visions to be successful with practicing ethical, credible and sustainable functioning, which can be strongly influenced also by the requirements of the legislation. Through the corporate governance statement, the legislator constantly increases its pressure on management and supervisory bodies regarding their awareness of ethical values (environmental, social, etc.). Since drawing up a corporate governance statement is becoming annual practice, the management and supervisory bodies are repeatedly being confronted with these issues and must make increasingly more ethical decisions and therefore think sustainably for their companies. As a result, their corporate social responsibility, ethical behavior, credibility and sustainable functioning are increasing.

The important guideline or solution regarding the quality of corporate governance in a manner of its sustainable functioning and development is a consistent

stakeholder approach to doing business. In order for a company to be successful in the long run, it is of great importance to consider the interests of all stakeholders, even the least powerful ones. Of course, these interests would have to be negotiated and accepted by all stakeholders, especially the key stakeholders – the owners. Furthermore, institutionally thinking, there is a need for companies to report their nonfinancial information in their statements of corporate governance, where the activities and the companies' goals, considering the interests of all other stakeholders besides the owners, would have to be explained in detail. This way, the interests of all company stakeholders would be considered, or at least represented, with the key stakeholders – especially the company's owners.

Strategic management and sustainable economy

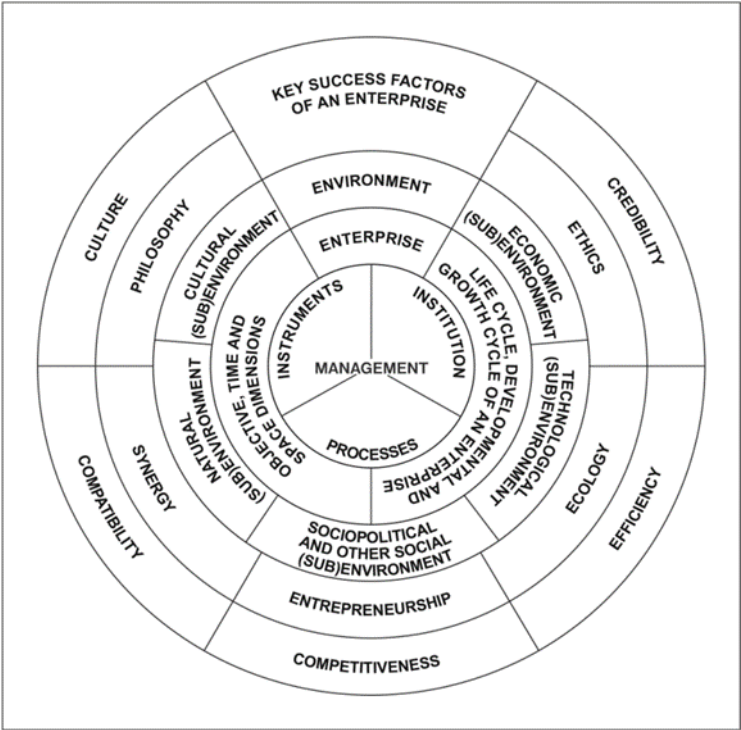
Strategic management has an essential role in a sustainable economy. The MER Model of integral management presents the framework for explaining the process, instrumental and institutional strategic management dimension. The main attention in the text is given to improving our understanding of the strategic planning process in which the main actors within a company (i.e., owners, shareholders, managers) should respond to the challenges of a sustainable economy. The process should result in a comprehensive strategic plan outlining the main direction of a company (i.e., corporate strategy) and how a company will improve its competitive position (i.e., business strategy).

Integral approach to management and strategic management

In the literature, we can find several definitions and descriptions of strategic management. Wheelen and Hunger (2012) define strategic management as “a set of managerial decisions and actions that determines the long-run performance of a corporation” (p. 53). According to the authors, the strategic management process includes scanning of the external and internal environment, strategy formulation, strategy implementation, and evaluation and control. The emphasis is on monitoring and evaluating opportunities and threats from the external environment considering the company's strengths and weaknesses. However, such an approach often “lacks” a clear and comprehensive description of strategic management as a process, as an institution, and as an instrumental system. More importantly, it gives only a slight overview of the relations with other parts of companies' governance and management. That is one of the reasons for discuss-

ing the strategic management in the sustainable economy in this book as an essential element of the integral approach to corporate governance and management which is in many cases illustrated as a model of integral management. For the presentation in this book, we chose the MER Model of integral management (Belak & Duh, 2012; Belak et al., 2014) as a framework for discussing strategic management and its challenges in a sustainable economy. The MER Model emphasized the multidimensional integration of an enterprise’s management with its environment, which is a prerequisite for realizing an enterprise’s fundamental purposes of surviving and developing. As in the MER Model, the relation of an enterprise with its environment and vice versa is in the center of governance and management. We believe that the MER Model presents a sound basis for building and improving our knowledge of strategic management’s role in companies’ efforts for sustainable development (Figure 3.22).

Figure 3.22. The MER Model of integral management



Source: Belak et al. (2014, p. 28).

The book’s scope does not enable us to present the integral approach to governance and management in detail. In the continuation of this Subchapter, we put

greater emphasis on dimensional' part of the model and not so much on other aspects of governance and management incorporated in the model (more detailed description of the model in Belak et al. (2014)).

Challenges for strategic management in sustainable economy

Nowadays, the competitive landscape in which companies functioning is characterized by rapid changes, increasing globalization (e.g., Ambrosini & Bowman, 2009; Baretto, 2010), and care for the natural environment (Wheelen & Hunger, 2012). Until the later part of the 20th century, enterprises could be very successful without paying any particular attention and care to their functioning effects on the environment. However, the situation in terms of environmental sustainability has changed, and enterprises must use business practices that reduce their impact upon the natural, physical environment (Wheelen & Hunger, 2012). The efforts and decisions on the ecological and environmentally friendly enterprise's functioning should not consider only its outputs (i.e., products, services, waste, measures, and information), but as well as processes, capacities and other structures, and inputs (e.g., raw materials, energy) (Belak et al., 2014). According to Thommen (2004), the following four major target areas of enterprises' environmentally friendly functioning should be distinguished: (1) resources, (2) emissions, (3) waste, and (4) high risks. Wheelen and Hunger (2012) call attention to climate changes and their effects on companies. The authors categorized the effects of climate change on industries and companies into six categories of risks: regulatory, supply chain, product, and technology, litigation, reputational, and physical. Environmental sustainability, therefore, presents a real challenge to the strategic management of companies. However, companies should not consider environmental sustainability as a threat but as an opportunity for improving their competitive position and as a condition for profitability growth. Environmentally friendly products using new technologies have become increasingly popular with customers.

Wheelen and Hunger (2012) emphasize that sustainability as a term includes not just ecological concerns and the natural environment but also economic and social concerns. For an enterprise, "[...] to be sustainable, that is, to be successful over a long period, it must satisfy all of its economic, legal ethical, and discretionary responsibilities" (Wheelen & Hunger, 2012, p. 123). A company needs to consider different groups of stakeholders affected by the achievement of the company's vision, mission, and goals. Therefore, companies should consider sustainability issues when making strategic decisions.

Sustainable corporate and business strategies

There are several attempts in the literature to create a classification of strategies. As the space limitations do not enable us to present them, we will focus our discussion on two groups – corporate and business strategies often found in the strategic management literature and the business practice. Planning and implementing these two groups of strategies is also provided within the MER Model of integral management (Belak et al., 2014). Companies should formulate their corporate and business strategies by addressing the sustainability issues, which should not be regarded as threats but as opportunities for long-term profitable growth.

Corporate strategy is primarily about the choice of a direction for a company as a whole. Its formulation and implementation are of great importance not only in a large multinational corporation but also in small, one-product enterprises. When an enterprise is dealing with sustainable development challenges, a decision on corporate strategy provides a direction on how to realize a sustainable vision, mission, and goals. The main concern of corporate strategy lies in three key issues facing an enterprise (Belak et al., 2014; Wheelen & Hunger, 2012):

1. The enterprise's overall orientation toward growth, stability, or retrenchment (so-called directional strategy).
2. The industries or markets in which the enterprise competes by providing products and services (so-called portfolio strategy).
3. How management coordinates activities, allocates resources, and develops capabilities among product lines and business units (so-called parenting strategy). The aim is to build positive synergies through resource sharing and development.

Due to space limitation, we will discuss only directional strategy composed of three general orientations (or so-called grand strategies): growth, stability, and retrenchment. Growth strategies expand the company's activities. There are basically two growth strategies which are concentration and diversification. A company that does business in a growing industry must grow to survive. It can grow internally (by expanding its operations globally and domestically) or externally (through mergers, acquisitions, and strategic alliances). Stability strategies make no change to the company's current activities. It means that a company is continuing its current activities without any significant change in direction. Retrenchment strategies reduce the company's activities. Wheelen and Hunger (2012) distinguish among retrenchment strategies the following ones: turnaround

strategy (contraction, consolidation), captive company strategy (giving up independence in exchange for security), sell-out/divestment strategy (obtaining a reasonable price for shareholders, employees can keep their jobs), and bankruptcy/liquidation strategy (the court decision on the claims on the company/the termination of the company).

Business strategy focus on improving the competitive position of a company's or business unit's products or services within the specific industry or market segment. Business strategies can be competitive and/or cooperative. When formulating them, we should answer the following questions (Weelen & Hunger, 2012): "Should we compete on the basis of low costs, or should we differentiate our products or services on some basis other than cost? Should we compete head to head with our major competitors for the biggest market share, or should we focus on a niche?" (pp. 231-232). We distinguish between lower-cost strategy and differentiation strategy that are called generic as they can be formulated and implemented in any company's type or size. Lower cost strategy is the ability of a company or a business unit to develop, produce, and market a comparable product more efficiently than its competitors. Differentiation strategy is the ability to provide unique and superior value to the customer in terms of quality, special features, and/or after-sale service. As its competitive scope determines the company's competitive advantage, a company or a business unit can choose a broad target (i.e., it aims at the middle of the mass market) or a narrow target (i.e., it aims at a market niche). Combining these two types of target markets with two generic strategies results in four business strategies: cost leadership and differentiation strategies having a broad mass-market target, and cost focus and differentiation focus when focusing on a market niche (narrow target) (Wheelen & Hunger, 2012). As an example of sustainable business strategy, the authors describe a company Patagonia which uses sustainability as a differentiation competitive strategy. Patagonia is a highly respected designer and producer of outdoor clothing, outdoor gear, footwear, and language. Their definition of quality "includes a mandate for building products and working with processes that cause the least harm to the environment. [...] We acknowledge that the wild world we love best is disappearing. That is why those of us who work here share a strong commitment to protecting undomesticated lands and waters. We believe in using business to inspire solutions to the environmental crisis" (p. 235). The company is recognized as a "green" company that is economically sustainable as well.

Dimensional approach to sustainable strategic management

Three dimensions of governance and management are distinguished within the MER Model, and that are the process, institutional and instrumental dimensions (Belak & Duh, 2012; Belak et al., 2014). When discussing governance and management as a process, we have to distinguish between hierarchical levels, essential functions, and process functions. The idea of hierarchical levels is based on observation of hierarchical order in (Belak & Duh, 2012):

- defining a vision and a policy of an enterprise consisting of a mission, purposes, and basic goals at the highest, or so-called political level;
- searching for strategic opportunities and developing strategies required for realizing the policy at the middle or so-called strategic level;
- planning and allocating resources and implementation tasks at the lowest, tactical, and operational levels.

Planning, organizing, directing, and controlling are described within the MER Model as basic functions. The governance and management process begins with planning which is followed by organizing and directing implementation. The process of controlling is not the last “step” but is required all the time on all hierarchical levels. Among the process functions, we distinguish three groups of activities which are: preparatory information activities, decision-making, and measures undertaking. Decision-making and measures undertaking present the essence of governance and management process; both are required in all steps and at all governance and management levels. Decisions on an enterprise’s policy and strategies are described as strategic ones due to their importance for sustainable survival and development. To address the sustainable strategic management, our attention will be given to the strategic level and strategic decisions. The process of searching for sustainable strategic opportunities and formulating sustainable strategies as a part of the planning process on the strategic level will be at the center of our discussion.

As governance and management processes are professionally demanding and crucial tasks in securing enterprises’ existence and development in a rapidly changing environment, people involved in this process (i.e., those having rights and responsibilities to make decisions) must be competent, being able to motivate others as well as possess authority to successfully perform their tasks. The institutional dimension of the MER Model provides solutions in this respect. Special attention is given to the personality traits, competencies, motivation, and authority of those involved in governance and management (Belak et al., 2014).

The MER Model also brings conceptual solutions regarding members of the organization – especially crucial stakeholders such as owners, shareholders, and managers – and their rights and responsibilities in governing and managing an enterprise. Of course, this conceptual solution needs to be adapted to a particular enterprise within the specific legal system. But on the conceptual level, we distinguish among (Belak et al., 2014):

- owners/shareholders, who decide on an enterprise’s policy;
- top management, who makes decisions on strategies and the strategic allocation of resources;
- middle management, who makes decisions on the acquisition and exploitation of resources (i.e., tactics); and
- first-line management, who makes decisions on the operative allocation of tasks.

The instrumental dimension of management and governance is presented by the instrumental system, which consists of values, business- and management-guiding principles, styles, techniques, and management methods (Belak et al., 2014). Especially values and principles are important as they influence the decisions on management styles and techniques, consequently influencing enterprises’ decisions on sustainability. We will discuss some basic features of the instrumental and institutional dimensions of sustainable strategic management.

Process dimension

Sustainable strategic management as a process consists of activities aiming to establish conditions for an enterprise’s sustainable development. The planning process starts with searching for strategic opportunities, which is followed by the formulation of strategies, their evaluations, and preparation of action plans. Searching for strategic opportunities comprises the process of scanning the company’s external environment and scanning the company’s internal environment (Duh, 2018). The primary purpose of environmental scanning is to identify strategic factors that are those external and internal elements that are going to affect the future of a company (Lombriser & Abplanalp, 2005; Müller-Stewens & Lechner, 2005; Wheelen & Hunger, 2012).

The external environment’s scanning is of crucial importance due to the environmental uncertainty, which is “the degree of complexity plus the degree of change that exists in an organization’s external environment” (Wheelen & Hun-

ger, 2012, p. 146). As most markets have become global, the number of factors that a company needs to consider in their strategic decisions has been rising and becoming more complex. Therefore, managers need to be aware of the factors within a company's natural, societal, and task environment. A company needs to scan the natural environment for factors that have been taken for granted in the past, such as the availability of fresh water and clean air. Managers are required not only to scan the natural environment for opportunities and threats but also to consider the impact of the company's activities on the natural environment. That helps managers identify opportunities to fulfil market demands on environmentally friendly products and/or services (Duh, 2018; Wheelen & Hunger, 2012). As emphasized by Wheelen and Hunger (2012), the concept of sustainability argues "that a firm's ability to continuously renew itself for long-term success and survival is dependent not only upon the greater economic and social system of which it is part, but also upon the natural ecosystem in which the firm is embedded" (p. 147). The societal environment consists of forces that influence long-run decisions. These forces are economic, technological, political-legal, and sociocultural forces. The task environment includes those factors which directly affect the company and, in turn, are affected by it. These are governments, local communities, suppliers, competitors, customers, creditors, employees/labor unions, special-interest groups, and trade associations. A company's task environment is typically the industry in which a company functions (Duh, 2018; Wheelen & Hunger, 2012). When identifying external strategic factors, managers can apply the issues priority matrix that helps identify those critical environmental factors that are judged to have both a medium to a high probability of occurrence and a medium to a high probability of impact on the corporation (Wheelen & Hunger, 2012).

The scanning of the internal environment (i.e., internal scanning) is often referred to as organizational analysis. It is done within a company to identify internal strategic factors, which are those critical strengths and weaknesses "that are likely to determine if the firm will be able to take advantage of opportunities while avoiding threats" (Wheelen & Hunger, 2012, p. 186). Internal scanning is concerned with identifying and developing a company's resources and competencies. Wheelen and Hunger (2012) call attention to a resource-based approach to organizational analysis where a resource (e.g., an asset, competency, process, skill, or knowledge) is strength when it provides the company with a competitive advantage and a resource is a weakness when it is something the corporation does poorly or cannot do and its competitors have that capacity. A functional approach to organizational analysis is corporate value chain analysis as differ-

ences among competitors' value chains are a vital source of competitive advantage.

The process of strategy formulation begins with a situation analysis. The situation analysis is the process "of finding a strategic fit between external opportunities and internal strengths while working around external threats and internal weaknesses" (Wheelen & Hunger, 2012, p. 224). After formulating different sustainable corporate and business strategies, selecting the best strategies has to be done. We can apply the quantitative and qualitative criteria in the process of choosing the best strategy for implementation. For example, Johnson, Whittington, and Scholes (2011) suggested the employment of three success criteria for evaluating strategic options: suitability, acceptability (i.e., whether a strategy meets stakeholders' expectations), and feasibility (i.e., whether a strategy could work in practice). Many authors (e.g., Pučko, 2003; Wheelen & Hunger, 2012) have identified suitability – namely, the selected strategy's capability to deal with the specific strategic factors identified in the previous steps of the planning process – as one of the most critical selection criteria. Formulating and selecting the best strategies is then followed by the creation of a strategic plan which important part is the program of strategy implementation. A strategic plan is also an essential basis for planning the projects for the realization of developmental activities and changes.

Institutional dimension

The selection of institutional solution of strategic management in a company depends on legislation and many other factors (e.g., legal form, historical development of an enterprise, industry specifics, the enterprise's size, stakeholders' characteristics, products and/or services, geographical dispersion, distribution channels, markets, production procedures, leadership styles, etc.) (Belak et al., 2014). As presented earlier in the text, top management is the one who makes decisions on strategies and strategic allocation of resources. However, in the strategic planning process, other managers, employees, and workers of special departments are responsible for providing support to a complex and crucial process of planning sustainable development of an enterprise. It means that the process of strategic planning is not limited to the strategic decision-makers but depends heavily on the working efforts of other staff as well. All those involved in strategic planning have an essential impact on strategic decisions regarding a company's sustainable development. Their knowledge and competencies, authority, motivation, and personal characteristics affect their understanding of

challenges a company faces in the sustainable economy and therefore, crucially impact a company's response to these challenges.

Instrumental dimension

As presented earlier in the text, the instrumental dimension emphasizes the importance of values, business- and management-guiding principles, styles, techniques, and management methods for governance and management of an enterprise. Due to space limitations, we will concentrate our discussion on the methods (sometimes also called techniques or tools) and their role in the strategic management process. Monitoring, evaluating, and disseminating information from the external and internal environment to key people within the enterprise has been recognized as crucial for identifying opportunities and threats and strengths and weaknesses of an enterprise when deciding on the right sustainable path in the future. Identifying strategic factors and formulation of strategies can be done more efficiently and effectively by applying different strategic management methods and techniques (Duh, 2018; Duh & Belak, 2014b).

Various methods and techniques are found in the literature to scan the external environment and identify external strategic factors, which are often organized into generally accepted categories of opportunities and threats (e.g., Duh & Belak, 2012; Wheelen & Hunger, 2012). Among those often found in the literature and companies practice are the methods for identifying sociocultural, technological, economic, ecological, and political-legal environmental factors (e.g., STEEP analysis, PESTEL analysis), for conducting industry analysis (e.g., Porter's approach to industry analysis, industry matrix), and various forecasting techniques (e.g., extrapolation, brainstorming, expert opinion, the Delphi technique, statistical modelling, scenario writing) (e.g., Duh, 2018; Duh & Belak, 2014a; Müller-Stewens & Lechner, 2005; Wheelen & Hunger, 2012). The scanning of the internal environment or so-called organizational analysis, which aims at identifying internal strategic factors (i.e., strengths and weaknesses), can be supported by several methods and techniques. Often suggested in the literature and practiced are (Johnson et al., 2011; Lynch, 2009; Wheelen & Hunger, 2012): value-chain analysis, internal factor analysis summary (IFAS table), resources and capabilities analysis, and benchmarking.

Several methods were created for situation analysis, a starting point for strategy formulation (e.g., Duh, 2018; Duh & Belak, 2014a; Müller-Stewens & Lechner, 2005; Wheelen & Hunger, 2012). As the main purpose of the situation analysis is to find a "strategic fit" between external opportunities and internal strengths

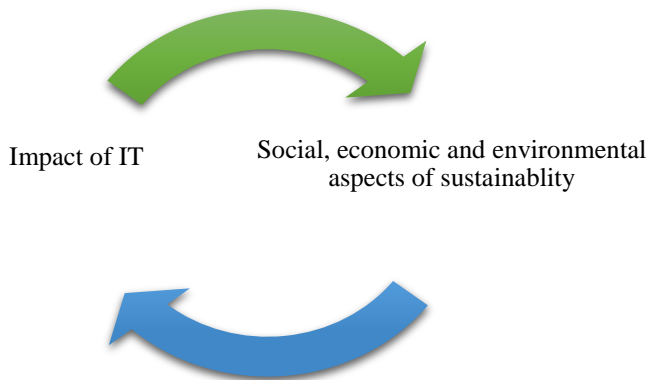
while working around external threats and internal weaknesses, methods like SWOT analysis, the strategic factors analysis summary (SFAS) matrix (Wheelen & Hunger, 2012), strategic analysis, and portfolio analysis (Lombriser & Abplanalp, 2005) can be applied. The next step in the planning process is the selection of the best strategy. Various methods and approaches can be applied during this part of the planning process (e.g., Duh & Belak, 2014a; Johnson et al., 2011). Lifecycle analysis, decision trees, financial analysis, financial ratios, cash flow analysis and forecasting, sensitivity analysis, break-even analysis, and shareholder value analysis are often cited in the literature.

IT management and sustainable economy

Aspects of green IT

Green IT is positioned within the interwoven whole of environmental, social and economic aspects of corporate sustainability. It refers to anything that minimizes IT uses a negative impact on the social, economic and environmental aspects of sustainability and using IT to help solve sustainability issues (Figure 3.23) (Albertoe, 2015).

Figure 3.23. IT circle



Source: Authors' own elaboration.

For example, while saving on energy costs (economic aspect) by deploying a green IT strategy, the environment is spared because CO₂ emissions are being reduced (environmental aspect). Simultaneously, it is reducing the dumping of poisonous and difficult to handle waste in developing countries (social aspect).

The IT industry is responsible for about 2% of global carbon emissions (O'Neill, 2010). But because of IT, the company can influence the other 98% in all other areas, as IT impacts all areas. It is, therefore very important that the industry provides sustainable products and services. It is no exaggeration to say that IT and related telecommunications have revolutionized the way businesses do business and individuals' lives (O'Neill 2010). Green IT issues can be divided into quantifiable social, economic, and environmental performance measures to help address the following three key aspects (Azapagic, 2004):

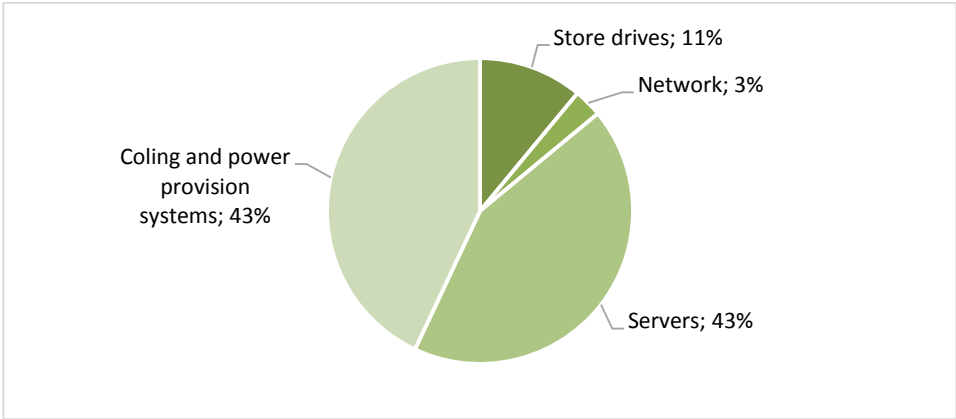
1. The social aspect refers to the demand for green IT products and services and is growing both from the individual and the organization's perspective. This demand stems from a greater reliance on IT in providing solutions to both business and personal problems. As IT is subject to constant technological development, it can be a significant challenge to adapt to both companies and their staff's continually changing technical requirements. It also means that there is a great demand for knowledge in the market. The social dimension of green IT refers to the impact that organizations have on the local communities in which they operate and the risks arising from green IT initiatives and activities. Social issues are mainly related to human rights, political rights and other social rights.
2. The economic aspect concerns an organization's impact on its stakeholders' economic situation and economic systems at local, national and global levels. Financial performance is essential for understanding an organization and its sustainability. To a lesser extent, this information is usually already reported in the financial accounts. Still, users of sustainability reports often want the organization's contribution to green IT to be part of a more extensive economic system (GRI, 2021).
3. The environmental aspects are relating to the increasing consumption of electricity and the growing waste of computer components. The total power consumption of servers, computers, monitors, data communication equipment, and data center cooling systems is continuously increasing. This increase in energy consumption leads to higher greenhouse gas emissions. Each computer used generates about a ton of carbon dioxide per year. However, computer components also contain toxic materials that mostly end up in landfills, polluting the soil and water. The growing number of computers and their use and frequent replacements are causing a significant impact of IT on the environment.

On that bases, we have three views of green IT: (1) Green IT manufacturing refers to producing products in a way that does not harm the environment. It encompasses everything from reducing the number of harmful chemicals used in products to making them more energy-efficient and packaging them with recycled materials. EU regulations require computer manufacturers such as Dell, HP, and Lenovo to abide by green manufacturing laws that limit the use of toxic substances, such as lead and mercury, in their products. (2) Green IT management and use have to do with the way a company manages its IT assets. It includes purchasing energy-efficient desktops, notebooks, servers, and other IT equipment and managing that equipment's power consumption. It also refers to the environmentally safe disposal of equipment through recycling or donation at the end of its lifecycle. (3) Green IT disposal refers to the safe removal of IT assets at the end of their lifecycle. It ensures that old computer equipment (otherwise known as e-waste) does not end up in a landfill, where the toxic substances it contains can leach into groundwater, among other problems. Many major hardware manufacturers offer take-back programs, so IT departments do not have to take responsibility for disposal (Walsh, 2007).

Data centers

Data centers can be thought of as the “brains” of the Internet. Their role is to process, store, and communicate the data behind the various information services we rely upon every day, whether it be streaming video, e-mail, social media, online collaboration, or scientific computing (Energy Innovation, 2020). Data centers utilize various IT devices to provide these services, all of which are powered by electricity. Servers provide computations and logic in response to information requests, while storage drives house the files and data needed to meet those requests. Network devices connect the data center to the Internet, enabling incoming and outgoing data flows. The most worrying consideration is the amount of electricity consumed by data centers worldwide. Hyperscale data centers use cheap, renewable energy, such as hydro and wind. Cloud data centers use the principle of outsourcing the programs and functions of one's computer to service providers over the Internet, which means sharing storage capacity with others. Both are generally more energy-efficient than company-owned data centers because there is a greater incentive for energy efficiency. The electricity used by these IT devices is converted into heat, which must be removed from the data center by cooling equipment that also runs on electricity. An example of data center electricity use is in Figure 3.24.

Figure 3.24. US data center electricity use in 2014 by end-use



Source: Shehabi et al. (2016).

That makes data center costly to operate, but companies’ data centers contribute to the overall corporate carbon footprint. The increasing reliance on electronic data drives the rapid growth in the size and number of data centers. This growth results from the swift adoption of internet communications and media, the computerization of business processes and applications, legal requirements for retention of records and disaster recovery provisions (Harmon & Auseklis, 2009).

Some of the world’s largest data center are Amazon, Microsoft and Google data centers. Each contains many tens of thousands of IT devices and require more than 100 megawatts (MW) of power capacity – enough to power around 80,000 US households (US Department of Energy, 2020). Data centers consume a significant amount of energy. As the number of global internet users has grown, demand for data center services is growing and raising concerns about growing data center energy use. Between 2010 and 2018, international IP traffic (the quantity of data traversing the Internet) increased more than ten-fold, while global data center storage capacity increased by a factor of 25 in parallel. Over the same period, the number of compute instances running on the world’s servers – a measure of total applications hosted – increased more than six-fold (Masanet, Shehabi, Lei, Smith, & Koomey, 2020). According to the report, data centers accounted for about 205 terawatt-hours of electricity usage in 2018, roughly 1% of all electricity consumption worldwide. The 205 terawatt-hours represent a 6% increase in total power consumption since 2010, but global data center compute instances rose by 550% over that same period (Patrizio, 2020). With the rise of data centers, some new technologies become essential.

New technologies and Green IT

In traditional industrial terms, IT and environmental sustainability seem mutually exclusive. One is driven by the sweeping technological change brought about by artificial intelligence (AI), the Internet of Things (IoT), and robotics, all promising to transform global manufacturing, industrial processes, and labor. Without IT, it is hard for companies to ease their pollution footprint or manage waste. Without a complete understanding of sustainability, the energy drawn by computers can be wasted.

Artificial intelligence (AI) is part of our everyday lives and refers to the technology which simulate of human intelligence in machines programmed to think like humans and mimic their actions. AI development is made possible by the sudden availability of large amounts of data and the corresponding development and wide availability of computer systems that can process all that data faster and more accurately than humans can. For example, AI is completing our words as we type them, providing driving directions when we ask, vacuuming our floors, recommending what we should buy, etc. AI may be applied to any device that exhibits traits associated with a human mind, such as learning and problem-solving. The ideal characteristic of AI is its ability to rationalize and take actions that have the best chance of achieving a specific goal. A subset of AI is machine learning, which refers to the concept that computer programs can automatically learn from and adapt to new data without being assisted by humans. A subset of machine learning is deep learning techniques that enable this automatic learning by absorbing vast amounts of unstructured data such as text, images, or video (Frankenfield, 2021). The goals of AI include learning, reasoning, and perception and is continuously evolving to benefit many industries. Machines are wired using a cross-disciplinary approach based on mathematics, computer science, linguistics, psychology, and more. The applications for AI are endless and can be applied to different sectors and industries. Some of the most common examples are (IBM Cloud Education, 2020): speech recognition, natural language processing, image recognition, real-time recommendations, virus and spam prevention, automated stock trading, ride-share services, household robots and autopilot technology. We can divide AI into two different categories: weak AI and strong AI. Weak AI embodies a system designed to carry out one particular job (personal assistants such as Amazon's Alexa and Apple's Siri). Strong AI systems are systems that carry on the tasks considered to be human-like. These tend to be more complex and complicated systems. They are programed to handle situations they may be required to problem solve without having a person intervene. These kinds of systems can be found in applications like self-driving cars

or hospital operating rooms. Based on that, AI will transform business practices and industries and has the potential to address major societal problems, including sustainability. The actual value of AI will not be how it enables society to reduce its energy, water, and land-use intensities, but rather, at a higher level, how it facilitates and fosters environmental governance.

Internet of Things (IoT) describes the network of physical objects (things) that are embedded with sensors, software, and other technologies to connect and exchange data with other devices and systems over the Internet. Over the past few years, IoT has become one of the most important technologies today. IoT devices range from ordinary household objects to sophisticated industrial tools. We can connect everyday objects – kitchen appliances, cars, thermostats, baby monitors – to the Internet via embedded devices, and seamless communication is possible between people, processes, and things. With more than 10 billion connected IoT devices today, experts expect this number to grow to 22 billion by 2025 (Oracle, 2021). With low-cost computing, the cloud, big data, analytics, and mobile technologies, physical things can share and collect data with minimal human intervention. In this hyperconnected world, digital systems can record, monitor, and adjust each interaction between connected things. IoT innovations in sustainable development are present in energy, agriculture, shipping, maintenance, etc. IoT facilitates typical tasks such as automated maintenance and reporting, data collection, analytics, and optimizing smart grids. It is also an established presence for smart home devices for heating, air conditioning, and lighting. IoT sensors reduce energy consumption, generate renewable energy on-site, and measure carbon consumption plus waste. Further, IoT used for precision agriculture can be another facilitator of change. Producing more and wasting less is the primary rationale behind smart, data-driven agricultural solutions. IoT is already in place when monitoring crops and soil conditions, screening and treating farm animals, and reducing greenhouse gas emissions. Another area of IoT use is maritime cargo shipping. Transporting 90% of the goods traded globally by volume, oceanic-cargo ships are moving oil, electronics, clothing, and food. A primary driver of the global economy, oceanic-cargo shipping consumes roughly 300 million tons of dirty fuel per annum. The shipping industry is producing, alone and for itself, nearly 3% of carbon emissions worldwide. Early adoption of IoT monitoring and rerouting for oceanic cargo shipping can reduce fuel consumption by up to 15% (Record Evolution, 2020). Also, predictive maintenance can avoid week-long overhauls and facilitate timely repairs. In the long run, this can extend the life cycle of existing fleets and minimize the need for fleet rejuvenation.

Robotics is the intersection of science, engineering and technology that produces machines, called robots, that substitute for (or replicate) human actions. In 2005, 90% of all robots could be found assembling cars in automotive factories. These robots consist mainly of mechanical arms tasked with welding or screwing on certain parts of a car. Today, we see an evolved and expanded definition of robotics that includes the development, creation and use of bots that explore Earth's harshest conditions, robots that assist law-enforcement and even robots that assist in almost every facet of healthcare. Characteristics of robots are: they all consist of some mechanical construction, they need electrical components that control and power the machinery, and they contain at least some level of computer programming. The robotics industry is still relatively young but has already made amazing strides. Robots can be found performing tasks that humans could not achieve. Mechanical bots come in all shapes and sizes to efficiently carry out the task for which they are designed. Generally, there are five types of robots: (1) pre-programmed robots operate in a controlled environment where they do simple, monotonous tasks; (2) humanoid robots are robots that look like and/or mimic human behavior; (3) autonomous robots operate independently of human operators; (4) teleoperated robots are mechanical bots controlled by humans, and (5) augmenting robots either enhance current human capabilities or replace the capabilities a human may have lost (Built In, 2019). Industries and companies have been trying to find ways to utilize robots to improve their processes, allowing businesses to be more efficient and profitable. Along with these benefits, it is becoming more evident that robotics helps improve sustainability efforts. Robots in today's world are helping to fight climate change, improve recycling and make manufacturing more sustainable. Robots are vital in reducing pollution and emissions of our manufacturing methods, and they are a crucial part of optimizing the manufacturing process to reduce the amount of energy consumed. They reduced our reliance on more extensive and more harmful vehicles and machines, and they help eliminate and clean-up waste in various ways. The sustainable opportunities that involve robots are endless, and we need to start applying them in new situations to make our Earth a better place to live.

KEY TERMS

Sustainability, social responsibility, corporate governance, strategic management, strategy, Green IT.

SUBCHAPTER SUMMARY

Sustainability includes not only ecological concerns and the natural environment, but also economic and social concerns. If companies want to be successful over a long time, they must consider the interests and expectations of different groups of stakeholders affected by the company's operations. In the past decade, the need for sustainable functioning of the companies became so strong that even EU and national legislatures changed (and is still changing) in order to foster such functioning of the companies. Therefore, companies should consider sustainability issues in their decisions on strategies and strategic allocation of resources, even more, companies should consider their sustainable functioning as the (only) key precondition of their long run existence and success. The MER Model of integral management is applied to deepen our understanding of strategic management's role in a sustainable economy. The MER Model distinguishes among process, instrumental, and institutional dimensions of strategic management.

Further, the presented Subchapter is dealing with the term sustainable IT or the more usually used term green IT, which describes the production, management, use, and disposal of IT to reduce damage to the environment. It is positioned within the interwoven whole of environmental, social, and economic aspects of corporate sustainability. Today, IT has an impact on all areas of companies. Therefore, the industry must provide sustainable products and services. Companies are recently moving their business to data centers because of their advantages, contributing to the overall carbon footprint. With the rise of data centers, new technologies such as artificial intelligence (AI), internet of things (IoT), and robotics become essential for green IT.

DISCUSSION QUESTIONS

1. How can corporate governance influence the sustainability of economy?
2. What role does a strategic management have in sustainable development of enterprises?
3. What types of strategies should a company formulate to improve its competitive position in sustainable economy?
4. What methods can be applied in the strategic planning process?
5. What impact does green IT have on a sustainable economy, and what new technologies will help achieve a sustainable economy?

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3.6. CSR – corporate social responsibility

Nikolina Markota Vukić^a

LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- understand the term of corporate social responsibility,
- comprehend the motives for social responsibility integration to business strategy,

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- analyze the external pressure for CSR integration,
- understand what the term Creating Shared Value means in the context of CSR,
- differentiate between CSR and corporate reporting.

Introduction

In order to understand the corporate social responsibility (CSR), it is crucial to understand the motives, pressures and main concepts/tools which companies use in order to achieve sustainability. The beginnings of the term CSR can be found in the writing of Berle (1931). However, the most frequently cited definition of CSR was given by Carroll (1991) who describes CSR as the economic, legal, ethical and philanthropic responsibility that an organization has towards society at a particular point in time. There are four components of corporate social responsibility: economic, legal, ethical, and voluntary or philanthropic components. Companies have rational economic factors, reasons or motives for CSR integration like innovation, operational efficiency, sales and marketing, customer loyalty, risk management, employee relations, supplier relations, media coverage or stakeholder engagement. However, external pressure from stakeholders, such as media, governmental and non-governmental organizations or institutional framework make the most significant pressure on companies for more responsible and transparent business. Visser and Kymal (2015) framed a concept of Integrated Value Creation (IVC) that implies business understands the need for turning the proliferation of societal aspirations and stakeholder expectations into a credible corporate response. Because of the strong legislative pressure in the EU and Non-financial Reporting Directive, corporate reporting presents a tool for increasing transparency and CSR. In this Subchapter, it will be possible to learn about CSR, why companies are integrating CSR and what are the benefits and tools in use for achieving corporate sustainability.

Definition of the corporate social responsibility (CSR)

The beginnings of the corporate social responsibility term in the academic literature can be found in articles by Berle (1931) and Dodd (1932) in which, for the first time, in addition to the profit function, the social-service function of business is mentioned. Dempsey (1949) in his article “The roots of business respon-

sibility”, published in the *Harvard Business Review*, sets out a philosophical discussion of the rational role of responsible business practice, based on four justice: (1) exchange justice based on market exchange, (2) distributive justice based on the relationship between government and the individual, (3) general justice based on the acceptance of legal frameworks, above which is the acceptance of ethical obligations, and in particular (4) social justice based on the general well-being and progress of the individual and society. David (1949) states three obligations of a company: (1) to make business efficient, (2) to make a business organization fair, and (3) to do business in a way that respects and contributes to the external environment. Dempsey (1949) and David (1949) jointly conclude that no individual or company can exist independently but needs a healthy environment in which to operate successfully, and that the business sector controls a significant amount of resources that give it significant power and opportunity for the development of society as a whole.

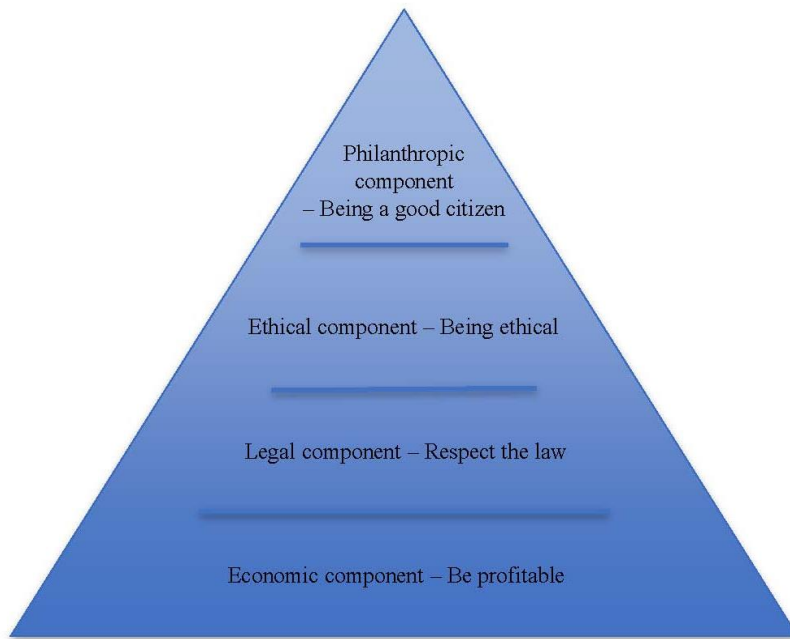
The number of definitions, publications, and concepts of corporate social responsibility increased in the 1970s, and some of them are used and are still relevant today. There are many definitions of corporate social responsibility, and there is no one universal, although the most frequently cited definition of corporate social responsibility was given by Carroll (1991) by merging his two previous definitions into one. The definition is as follows: Corporate social responsibility includes the economic, legal, ethical and philanthropic responsibility that an organization has towards society at a particular point in time. There are four components of corporate social responsibility: economic, legal, ethical, and voluntary or philanthropic components that can be represented in the form of a pyramid, as shown in Figure 3.25.

Following this definition, most scholars have recognized that the concept of corporate social responsibility should include the economic aspect as well, not just social and environmental issues.

The development of the concept of social responsibility has resulted in the emergence of new terms such as: corporate sustainability, business in society, corporate citizenship, corporate responsibility, corporate governance, business (social) responsibility, sustainable business, ethical corporations. Montiel (2008) conducted a systematic analysis of the CSR definitions and corporate sustainability used in the literature, and identified overlaps between these two concepts, so he proposed the integration of them. It is precisely the notion of CSR that has attracted much attention, that is the notion of corporate sustainability introduced by van Marrewijk and Werre (2003). According to the authors, corporate sustain-

ability is a voluntary business of the company in the field of care for society and the environment, and interaction with stakeholders, which is in a way a description of corporate social responsibility.

Figure 3.25. Carroll's pyramid



Source: Carroll (1991, p. 42).

The definition of corporate social responsibility most widely accepted by the business and academic world is the definition of the European Commission (2006): “Corporate social responsibility is a concept according to which companies voluntarily integrate social and environmental aspects into their business, and into interaction with its stakeholders. By adopting this concept, the company decided to go beyond the minimum statutory activities to respond to social problems and needs”.

It is possible to conclude that over time the number of CSR definitions has increased, but it is crucial to identify whether the proposed definitions and terms are indeed different or are they just different ways of approaching the same idea. Because of the large number of definitions, Dahlsrud (2008) analyzed 37 definitions of CSR presented in the period from 1980 to 2003 based on the identified dimensions of CSR: environment, economy, society and stakeholders. Based on these dimensions, Dahlsrud (2008) concluded that all definitions of CSR always

contain the same dimensions – social, environmental and economic. Accordingly, the author states that the lack of a unified definition of corporate social responsibility is not worth worrying.

Motives for integrating social responsibility to the company

Many companies have committed themselves to the environmental, social, and governance goals and performance. However, there are still CFOs who consider it as a cost rather than a source of value, even though most recent studies show a correlation between sustainability and financial performance. According to Whelan and Douglas (2021), there are two reasons why CFOs do not see the connection between sustainability and positive financial performance. First is the different language and metrics used by sustainability and financial departments. CFOs use financial metrics like EBIT and ROI, and sustainability professionals focus on measures such as reductions in wastewater or emissions. Secondly, few companies adequately track the returns on their existing sustainability investments or carefully assess those on future ones. In order to make those links between sustainability and economic performance clearer, authors have identified nine mediating factors which can motivate integration of social responsibility to the company. Nine mediating factors or motives which drive financial results through social responsibility are (Whelan & Douglas, 2021):

1. **Innovation.** Sustainable business strategy can spark innovation in design, process, products, and services. In 2012 Nike used sustainable design principles to develop Flyknit, a recycled polymer woven into the shoe upper, resulting in athletic shoe brand which have become a \$1 billion business.
2. **Operational efficiency.** Sustainable business strategy can improve operational efficiency and cut costs by reducing waste and the use of natural resources. In Nestlé's manufacturing operations in drought-prone South Africa, improvements in wastewater reduction and water recovery increased plant production by 32% from 1997 to 2001 while reducing water and water management costs by 12%.
3. **Sales and marketing.** Sustainable business strategy and sustainable products and/or services can help a company and brand to stand out from the crowd and increase awareness, and in return, sales.
4. **Customer loyalty.** People are more devoted to purpose-led brands that make a positive contribution to society, so sustainable business strategy can produce customer loyalty.

5. Risk management. Investors and corporate leaders are becoming increasingly focused on sustainability-related risks in markets, regulation, reputation, and operations. Ignoring those risks can have significant negative financial impacts. A motive for implementing social responsibility to the company can decrease sustainability-related risks.
6. Employee relations. Workers identify more strongly with a company if they believe it is socially and environmentally responsible by increasing commitment and improving morale. A motive for social responsibility implementation is building a stronger relationship between employees and the company.
7. Supplier relations. Supplier relations are often solely transactional, but sustainability focus can foster a broader and more fruitful partnership with suppliers.
8. Media coverage. News coverage of a firm's environmental and social performance is significant in consumers' evaluation of a firm and their intent to buy its products, according to a study published in *Corporate Reputation Review*. Favorable media coverage can be a motive for implementing social responsibility to the company.
9. Stakeholder engagement. A firm's sustainable stance and activities can improve relations with local communities and society more broadly, with positive financial impacts. Improved relations with local communities and society can be a good motive for social responsibility implementation in the company.

It can be concluded that there are rational economic reasons and motives for implementation of the social responsibility to the company. However, stakeholders, media, governmental and non-governmental organizations make the most significant pressure on companies for more responsible and transparent business. The absence of the pressures is a stimulus for implementation of corporate social responsibility in the business strategy.

Institutional framework of CSR

The process of law making and its implementation is an important factor for companies to integrate social responsibility policies and thus become carriers of social change. Laws initiated by the government in order to encourage social responsibility practices can achieve better implementation than voluntary initiatives. The most well-known voluntary initiatives for socially responsible busi-

ness are the United Nation Global Compact and the Global Reporting Initiatives, by which companies analyze their business and inform the interested general public by publishing lists of social, economic and environmental activities.

Conducted empirical research in the field of institutional theory provides evidence that institutional changes lead to an increase in CSR obligations and increased cross-sectoral cooperation. This evidence was shown in qualitative comparative case studies (Hamman, 2004): (1) institutional differences in the US and EU result in different expectations of CSR, demonstrated by three qualitative secondary case studies (Doh & Guay, 2006), (2) when trying to institutionally translate one institution (for example, socially responsible business) into another context, a hybrid institution is created (Mohan, 2007); (3) two or more theories in combination, one of which is an institutional theory, are used to predict CSR behavior (Beliveau, Cottrill, & O'Neill, 1994).

Another comparative institutional study conducted in Western, Central, and Eastern Europe on attitudes toward corporate responsibility by Furrer et al. (2010), highlights important historical, institutional, and cultural differences, and divides them into two interrelated dimensions: (1) socialist legacy and (2) level of economic growth and growth rate. Central and Eastern European countries are in transition characterized by growing economic development as well as institutional changes from a planned industry to a liberal economy and the adoption of a free market system (Hoskisson, Eden, Lau, & Wright, 2000). According to Inglehart and Welzel (2005), the liberal economies of Central and Eastern Europe emphasize individual progress, materiality, respect for legal authority and maximization of economic goals, while the developed countries of Western Europe emphasize the high level of economic security, technological development and education resulting in postmaterialist values, emphasizing subjective well-being, self-expression, quality of life, as well as caring for the environment, etc. Kemmelmeier, Król, and Kim (2002) state that individuals in Central and Eastern European countries are more preoccupied with their personal economic situation and less willing to sacrifice their newly acquired wealth for the environment, while in richer and more stable countries, such as those in Western Europe, individuals have accepted their financial situation, so social and environmental sustainability in such countries is more outstanding (Inglehart & Welzel, 2005).

Authors such as Aguilera and Cuervo-Cazurra (2004), Campbell (2007), and Waddock and Graves (1997) argue that social and ethical responsibility is likely to gain more importance in Western European countries given their developed legal and political institutions aimed at fostering socially responsible business

behavior, as well as the high level of economic and human capital committed to accountability of companies. In contrast, research by Filatotchev, Buck, and Zhukov (2000) and Vynoslavskaya, McKinney, Moore, and Longenecker (2005) proves that less developed and changing business regulatory and legal systems in Central and Eastern Europe result in the financial dimensions of business taking precedence over the dimensions of corporate social and environmental responsibility.

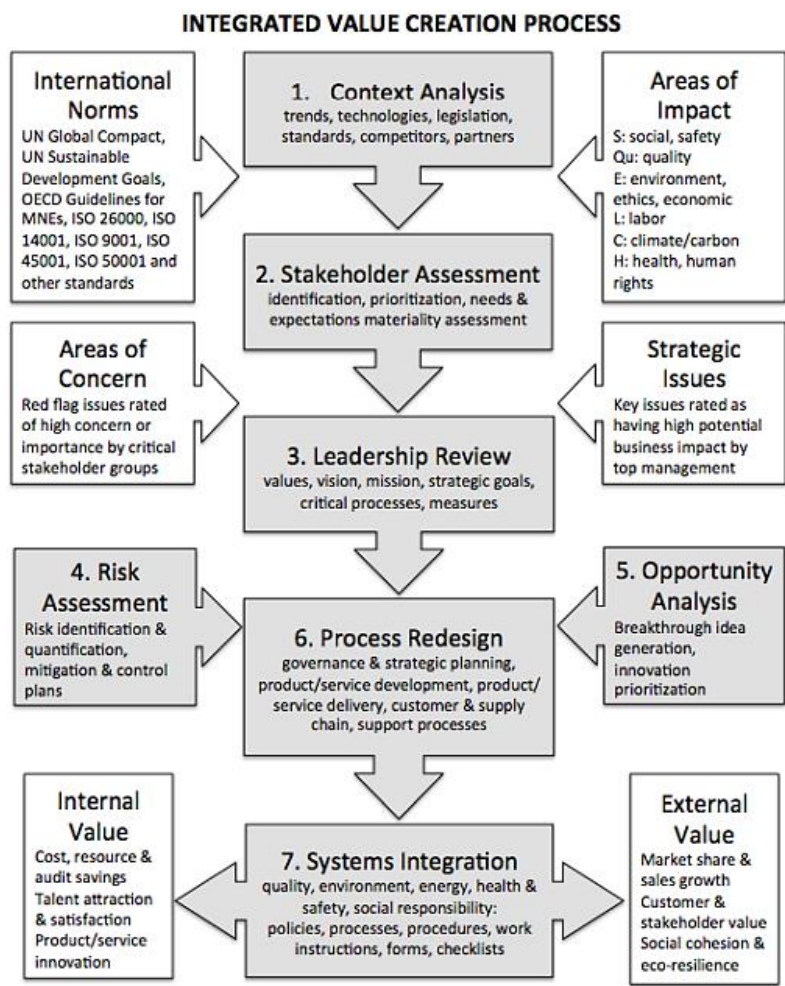
Empirical research by Pedersen, Neergaard, Pedersen, and Gwozdz (2013), Beck, Frost, and Jones (2013), Furrer et al. (2010), and Kourula (2010) show how institutional frameworks can explain pressures, such as regulatory ones, and shape CSR. External institutional influences on corporate responsibility vary from country to country, so multinational corporations (MNCs) face the ethical dilemma of implementing the same ethical practices in different countries or adapting ethical practices to local conditions. It is therefore important to understand the importance of the institutional framework according to Scherer and Smid (2000) who argue that the economic system will be limited if multinational corporations are prevented from opportunistically transferring banned activities from domicile countries to countries with lower social and environmental standards and weaker regulatory frameworks.

Corporate social responsibility and Integrated Value Creation (IVC)

A useful evolution of the corporate responsibility and sustainability movement is Integrated Value Creation (IVC). It combines existing concepts like corporate social responsibility (CSR), sustainability and creating shared value (CSV) – but with shift and focus on integration and value creation. Integrated Value Creation (IVC) is a concept and practice that has emerged from a long tradition of thinking on the role of business in society (Carroll, 1999). IVC is a methodology for turning the proliferation of societal aspirations and stakeholder expectations – including numerous global guidelines, codes and standards covering the social, ethical and environmental responsibilities of business into a credible corporate response, without undermining the viability of the business (Visser & Kymal, 2015). A company can use an IVC in order to integrate its response to stakeholder expectations (using materiality analysis) through its management systems (using best governance practices) and value chain linkages (using life cycle thinking). This integration is applied across critical processes in the business,

such as governance and strategic planning, product/service development and delivery, and supply and customer chain management. Authors emphasize that IVC aims to be a tool for innovation and transformation, which will be essential if business is to become part of the solution to our global challenges, rather than part of the problem.

Figure 3.26. Integrated value creation



Source: Visser & Kymal (2015).

As presented in the Figure 3.26, IVC implementation is a 7-step process, which can be described as: 1) context analysis, 2) stakeholder assessment, 3) leadership review, 4) risk assessment, 5) breakthrough analysis, 6) process redesign, and

7) systems integration. Of course, the process must also remain flexible enough to be adapted to each company context and to different industry sectors.

To conclude, IVC combines many of the ideas and practices already in circulation, but signals some important shifts, especially by using the language of integration and value creation. These are concepts that business understands and can even get excited about (whereas CSR and sustainability tend to be put into peripheral boxes, both in people's heads and in companies themselves). It is a methodology for turning the proliferation of societal aspirations and stakeholder expectations into a credible corporate response, without undermining the viability of the business (Visser & Kymal, 2015).

Corporate reporting for more transparent CSR

Corporate social responsibility determined by law could be justified by the fact that the business sector creates benefits and progress for the society in general, while the society allows companies to use public resources to operate successfully (O'Dwyer, 2001). For this reason, the society has the right to know how the business sector exploits public resources, and how and to what extent it returns to society what it has used from public resources to make its own profit (Deegan & Unerman 2006/2008). Statutory corporate social responsibility increases the transparency of the company's impact on society and the environment (Beck et al., 2013), and can change the company's business in order to create incentives for managers to better deal with employees, investors, customers, suppliers, regulators and civil society.

The European Commission's legislative framework like Accounting Directive 2014/95/EU, EU Regulations (EU) No. 2019/2088, (EU) No. 2020/852 and (EU) No. 2018/2089, which require certain large companies and financial institutions based in the European Union to attach nonfinancial or corporate social responsibility reports and publish sustainability-related disclosures are the biggest steps towards legalizing corporate social responsibility and sustainability within the European Union. For this reason, it is important to understand the practices and differences of corporate social responsibility reporting, and how companies can implement it in their business.

According to Markota Vukić (2016), it is possible to conclude that better CSR reporting increases the quality of the social responsibility strategy, which ensures even greater business progress. However, companies that do not report and

do not intend to start CSR reporting, consider that social responsibility is a burden and possibly an imposed obligation, where they do not see all the benefits of social responsibility.

KEY TERMS

Corporate social responsibility (CSR), CSR motives, Carroll's pyramid, Integrated Value Creation (IVC), integrated value creation process, institutional framework, corporate reporting, nonfinancial reporting.

SUBCHAPTER SUMMARY

Corporate social responsibility is a term whose importance and implementation increases as the environment in which a company operates becomes more unstable for profit maximization. Companies have rational economic factors, reasons or motives for CSR integration. However, external pressure from stakeholders, media, governmental and non-governmental organizations or institutional framework make companies focus on more responsible and transparent business. As an extension or a shift of the CSR, Visser and Kymal (2015) framed a concept of Integrated Value Creation (IVC) that business understands for turning the proliferation of societal aspirations and stakeholder expectations into a credible corporate response, without undermining the viability of the business. As societal aspirations and stakeholder expectations include numerous global guidelines, codes and standards covering the social, ethical and environmental responsibilities of business, corporate reporting is a tool for communication between company and its stakeholders in order to increase transparency and extend CSR. This Subchapter addresses CSR, the reasons why companies are integrating CSR, the benefits and tools in use for achieving a corporate sustainability.

DISCUSSION QUESTIONS

1. Define the term corporate social responsibility (CSR).
2. What are the motives and factors of CSR integration?
3. Describe the concept of Integrated Value Creation (IVC).

4. Explain the institutional framework of CSR.
5. Describe the corporate reporting of CSR.

PROPOSED TEACHING METHODS

1. Lectures.
2. Guided discovery learning.
3. Discussion.
4. Group/team learning.

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3.7. Financial institutions, markets and instruments for a sustainable economy

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LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- understand the role of the financial sector in the transition to a sustainable economy,
- acknowledge the main characteristics of an ethical bank,
- distinguish green loans and green bonds,
- acknowledge the issues of environmental losses and the necessities of prevention,
- recognize a climate-index policy.

The role of the financial sector in the transition to a low-carbon and sustainable economy

The financial, economic, and social turmoils that have occurred over the past fifteen years call for a profound reconsideration of finance theory and the role of the financial sector, renewing interest in what could be considered as “alternative finance”. The debate about ethics/sustainability and finance is still open. Scholars are divided between those who consider this relationship to be an oxymoron, since financial market structure leads to the maximization of profit grounded in self-interest, and those who consider ethical values to be the basis of finance, whose pillars are the mutual trust of the public and other financial institutions.

Regulators agree on the opportunity and relevance of banks’ path towards sustainability, given the role they play within economic systems (La Torre, Leo, & Panetta, 2021). The banking system performs several basic functions in market economies: it collects savings from units in financial surplus, allocates capi-

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tal by employing liquidity to units in financial deficit, produces bank money, manages the payment system, and redistributes risks. A bank, in its dual role of capital provider and institutional investor, can significantly influence economic development, from both a quantitative and qualitative point of view. Banks' expertise in credit risk management makes them uniquely qualified to ensure that increased funding for sustainable assets and activities does not come at the expense of financial stability (Zingales, 2015). Banks are the backbone of the global financial system, and consequently, play a key role in properly financing the projects required for the transition to a sustainable economy.

Besides, banks can play an important role in the market for sustainable and responsible products and services, through their assets under management. Banks can distribute responsible products managed by other intermediaries, such as sustainable mutual funds managed by an asset management company. Moreover, banks are major issuers on the bond markets, including the corporate green and social bond markets. In the field of services, banks can offer consultancy services on ESG (Environment, Social, and Governance) matters, such as evaluations of environmental initiatives and projects carried out by their customers. Finally, they can offer placement and underwriting services for sustainable and responsible instruments issued by third parties. Banking companies can therefore affect the sustainable finance market, both on the demand and the supply side (Thompson & Cowton, 2004; UNEP FI, 2016).

Consequently, legislators are engaged in defining new policies for the development of sustainable finance, driven by international agreements aimed at promoting investments that take account of ESG considerations. The most important of these include the UN 2030 Agenda for Sustainable Development (September 2015), the Paris Climate Agreement (December 2015), and the European Commission Action Plan on Sustainable Finance (March 2018).

Politicians and regulators are increasingly co-opting banks in the implementation of climate change policies, given their unique role in capital formation and allocation. Therefore, the rise of sustainable finance as a key global topic has put banks under pressure. In Europe, the regulation aimed to encourage a sustainable economy is structured in a complex set of measures, of which a substantial part is aimed precisely at the financial sector.

In particular, the European Green Deal, a set of political initiatives and actions proposed by the European Commission and aimed at achieving climate neutrality in Europe by 2050, is based on the awareness that the transition to a low-impact, more sustainable, and circular economy, in line with the Sustainable

Development Goals defined by the United Nations, is the only way to ensure long-term competitiveness for the European Union (Eurostat, 2020). All economic sectors are involved in the European Green Deal, but the financial sector is central in supporting the transition to a more sustainable economic model. Since financial institutions are involved in directing and allocating capital flows to green investments, they represent one of the main means to achieve the ultimate goal of a fairer, cleaner, more resilient, and more competitive Europe (Weber & Feltmate, 2016).

The goal of regulators is to encourage a radical change of direction in the management of the traditional banking business (Lagoarde-Segot, 2015). The international financial crisis that started in 2008 highlighted phenomena of high moral and social irresponsibility by financial intermediaries, associated with a very limited level of transparency, which has led to repeated scandals and disruptions. The growth of the financial sector, the sophistication of investment products, and the speed of financial transactions profoundly altered the relationship between finance, the real economy, and society. The financial crisis was primarily a crisis of confidence in the financial system. The new regulatory system, therefore, intends to impact the principles and values that form the basis of finance. The banks, rather than being the origin of the economic crises, in the new vision should represent active actors in the problem's solution. Not only through strategic and operational choices oriented to the internal sustainability, but also through greater attention to the environmental, social, and good governance characteristics of the counterparties financed or the issuers of the securities in which the banking book is invested. Through sustainable internal behaviors and sustainability-oriented assessment of loans and investments, banks can represent key players in achieving the goals set in international agreements on climate and sustainable development (Lehner, 2016).

Regulation on sustainable finance is mainly focused on increasing the levels of disclosure of financial intermediaries on ESG issues.

Under the legislation on Non-Financial Reporting (Directive 2014/95/EU), banks, as well as other large and relevant companies, are required to publish information on the impact of their activities on ESG factors. The regulation encouraged transparency for example on the policies implemented by the bank in the field of environmental protection, social responsibility, employee interactions, respect for human rights, gender diversity (European Parliament and the Council, 2014; European Commission, 2019).

Banks are not only required to comply with this legislation by increasing their level of disclosure but are also the beneficiaries of the nonfinancial reporting of the other target companies of these new rules. For their lending and investment activities, therefore, banks can now lean on the ESG information published by the main European companies (Carnevale & Mazzuca, 2014).

However, for such communications to be effective, standards must be in place to define which activities and processes can be defined as sustainable. In this regard, Regulation EU 2020/852 (EU Taxonomy Regulation) was recently published, providing a taxonomy of economic activities that can be considered sustainable. In particular, the European regulators have reached an agreement on the regulatory framework that defines which activities can be defined as sustainable from an environmental perspective (green list). The economic activities that can be considered unequivocally as eco-sustainable are those activities that contribute substantially to at least one of the six identified environmental objectives (climate change mitigation, climate change adaption, water & marine resources, circular economy transition, pollution prevention & control, biodiversity & ecosystem protection) and, at the same time, do not cause significant damage to one of the other objectives defined by the European regulation (Do Not Significantly Harm principle). This taxonomy is going to be implemented to also include the list of sustainable activities from a social point of view. Also in this case, the bank, in its role as investor, issuer, and securities broker, can represent both a target and a beneficiary of the regulation. Thanks to this regulation, banks will be able to better understand which assets can be considered as sustainable targets, as well as end investors will be able to better evaluate the actual sustainability of a financial product (European Parliament and the Council, 2020). Both retail and institutional investors will have the opportunity to know how much their investments are sustainable, being able to play their role in achieving environmental and social objectives.

The European directive on green taxonomy has integrated a specific Directive aimed at increasing the transparency of the operational processes implemented by sustainable financial operators: Regulation EU 2019/2088 (Sustainable Finance Disclosure Regulation – SFDR). This legislation targets financial market participants and financial advisors, requiring them to provide the end investor with all the information necessary for making informed investment decisions. The goal is to increase the level of disclosure so that the end investor can distinguish the so-called genuinely sustainable from greenwashed products/institutions (European Parliament and the Council, 2019). The information requested may relate to the financial operator as well as the specific products offered by it. They

must be provided both in the pre-contractual documentation, and the intermediary's or consultant's website. Further details on the information to be provided based on the aforementioned regulation are provided in subchapter 2.3.5. In particular, concerning sustainable products, the type of information is connected to the specific nature of the financial instrument, distinguishing between products that promote environmental and social characteristics and products that have the specific objective of determining a positive impact on the environment and society. This distinction highlights the wide heterogeneity of products attributable to sustainable finance today (European Sustainable Investment Forum [Eurosif], 2018; Vecchi, Balbo, Brusoni, & Caselli, 2017). These products can be either placed by banks to investors or purchased by banks in their role as institutional investors. The deep analysis of the various activities carried out by the banks in this context, together with the study of the ESG issues regarding their internal processes, may help to assess their level of sustainability.

Ethical and sustainable financial institutions

As highlighted in the previous section, regulators and supervisors are pressing banks to encourage more responsible and sustainable behaviors. In general, financial institutions have been subjected to various internal and external pressures that have led them to consider environmental, social, and good governance practices in their operational decisions, and to set ESG benefits as a key strategic goal in the long-term horizon (Weber & Remer, 2011).

Other than from regulators, further external pressures come from bank customers, which are demanding sustainable behavior and responsible products from their financial institutions. Greater awareness of the negative impacts of climate change and the growing sensitivity towards social and governance issues have led to the strong growth of savers and investors interested in the ESG profile of their intermediaries, as well as in responsible and sustainable products to invest in. Consequently, sustainability can represent a significant commercial opportunity for banks, favoring customer attraction, customer satisfaction, and customer retention (The Vienna Group, 2015).

Other than the commercial dimension of sustainability, also the financial dimension of the phenomenon may be relevant. An important funding channel for banks is represented by institutional investors, usually oriented to long-term investments and more and more involved in sustainable investing. Bank funding on the wholesale markets could for example be positively conditioned by the

inclusion of the intermediary in a sustainable fund or index, such as the DJ Sustainability Indices, the FTSE4Good Indices, the MSCI Global Sustainability, or the MSCI Low Carbon (Wendt, 2015).

Among the internal drivers that lead banks to sustainability, therefore, it is possible to include the growing awareness of the strategic importance of sustainability on the part of shareholders and managers. By producing value for society and the environment, the responsible bank can increase the value produced for its own business (La Torre & Vento, 2008). Bad conduct or inactivity in the ESG field can produce a loss of market share and harm the bank's reputation.

The internal commitment of shareholders and top management to sustainability is also based on its risk dimension. A lack of attention to sustainability may not only increase business risks, like reputational and strategic risks, but it can also negatively affect financial risks, like operational, credit, and market risks (Dell'Atti & Trotta, 2016; Fiordelisi, Soana, & Schwizer, 2013). In particular, banks are progressively increasing their awareness of the links between the creditworthiness of companies (and the consequent credit risk for the intermediary) and the related environmental risk (Labatt & White, 2011; Mengze & Wei, 2015). For example, the lack of attention of a company to its ecological footprint could lead to an increase in its operating costs, also in the form of legal sanctions, as well as a growth of investments to be compliant with the legislation, with consequent negative effects on corporate solvency (Weber, 2012). Similarly, the value of banks' investments in financial securities could be affected by risks directly connected to the ESG profile of the issuers (Kinder & Domini, 1997; Weber, Scholz, & Michalik, 2010). Overall, the integration of ESG assessments in internal processes related to the lending or investment activities can mitigate bank risks, directly affecting the bank's profitability and its long-term sustainability.

Furthermore, financial intermediaries are conditioned by the internal pressures of other stakeholders, which guide corporate behaviors towards a more sustainable approach. In particular, the ability to attract, retain and satisfy bank staff is closely linked to the intermediary's commitment to social and good governance issues (Scholtens, 2009; Shiller, 2013; Viganò & Nicolai, 2009).

Also due to these pressures, in recent years more and more banks have implemented and communicated their adherence to a sustainable approach, paying attention to ESG factors in their internal processes, in the offer of products and services, and more generally in the relations with their stakeholders. Behaviors inspired by corporate social responsibility and ESG issues seem no longer to be confined to the niche of financial institutions that originated in the wake of ethi-

cal finance. Projects that pursue social and environmental objectives are spreading – and are sometimes even placed as flagships – even in several traditional banking institutions (Bouma, Jeucken, & Klinkers, 2017; Caré, 2018).

This contamination between finance and ethics is certainly positive, but it can hide some latent problems. The fact that a bank engages in social or environmental projects is not a guarantee that the activities of that institution are sustainable as a whole. For example, banks may implement “greenwashing” activities in the field of environmental protection, i.e., the construction of a fictitious image of the company as eco-friendly through the implementation of ad hoc campaigns, which aim to mask the ecological unsustainability of most of the other activities carried out. In the same way, we can speak of “pinkwashing” referring to companies that disguise discrimination by gender and other deceptive governance behaviors (Pizzo & Tagliavini, 2013).

To clarify the issue and better understand the approach adopted by financial institutions towards sustainability issues, it is important to distinguish between ethical banks and sustainable banks. Moreover, it is necessary to develop suitable sensitivities and models for discerning between the actors who work seriously and all-round in sustainable finance and those who improvise themselves strategically responsible (Hangl, 2014; San-Jose, Retolaza, & Guiterrez-Goiria, 2011).

Sustainable banks are conventional banks, which have integrated a sustainability-oriented approach into their operations. They have not been established with a precise social or charitable mission, but, on the contrary, are typically aimed at pursuing private profits. Sustainable business management, however, assumes that corporate decisions are also guided by the consideration of ESG issues, to favor the achievement of profits in the medium-long term (International Finance Corporation [IFC], 2007; Jeucken, 2011). Sustainable banks integrate ESG assessments into their traditional business (Lehner, 2016).

On the contrary, ethical banks are born with a specific social or environmental mission and are based on a set of values that give priority to ethical and ecological choices, social utility, public interest, local development, usually rejecting any speculative activity. The business of ethical banks is focused on traditional credit intermediation activities and the loans granted are aimed at creating a social or environmental benefit, to achieve a positive impact on society together with a sustainable financial return (Benedikter, 2011; Cowton, 2002). While sustainable financial institutions need to change their way of doing finance to be sustainable, ethical banks were born around this concept.

Ethical banks are not recent phenomena at the international level (Puaschunder, 2019). Initially led by religious movements and associations, a more laic approach to ethical finance has emerged in Europe since the seventies, which has favored the spread of initiatives and the establishment of new financial intermediaries based on social and environmental principles (Mews & Abraham, 2007; Schwartz, Tamari, & Schwab, 2007). Within the Italian context, Banca Popolare Etica was established in Padua in 1999, alongside other European ethical banks, such as the French *Crédit Coopératif*, the Dutch Triodos Bank, the English Ecology Building Society, the Danish Merkur Cooperative Bank, or the Norwegian Cultura Bank (Baker & Nofsinger, 2012; Maccarini & Prandini, 2009).

In the recent past, ethical banks have grown, consolidated, and structured within international networks. They demonstrated, especially during the various economic and financial crises that have occurred over the last fifteen years, their resilience and their capacity of supporting the territory and the communities (Heiko Spitzeck, Pirson, & Dierksmeier, 2012).

Indeed, although ethical banks and conventional financial institutions are regulated by the same authorities, and must compete within the same market, they are not the same type of institutions. Ethical banks differ from other traditional intermediaries for five main characteristics (Garonna & Spaoloni, 2016):

- The mission. Ethical banks usually have a declared social mission. Their business model is based on two principles: creating social and/or environmental value, as well as achieving a sustainable financial return.
- The customers. Ethical banks provide loans to specific categories of borrowers that generally are not considered by traditional banks. Besides, ethical banks sometimes seek to invest in organizations with similar values, including making proportionate investments in other values-based banks.
- The remuneration schemes and compensation policies. The focus on wage equity by ethical financial institutions is particularly remarkable. Compensation schemes are perceived as the most noticeable and effective ways in which organizations can reduce (or increase) economic inequality in society. Consequently, the majority of ethical banks set a salary cap to ensure that top managers do not earn disproportionately higher wages compared to other employees. Besides, no or very limited and equitable bonus systems are introduced, as well as no or marginal variable compensation is distributed.
- Disclosure. Ethical banks provide information on loans and other banking operations transparently.

- Impact of the activity. Ethical banks provide loans to create social or environmental benefits. For this reason, several ethical banks have developed impact measurement methodologies.

These principles are shared by ethical banks, some of which are organized in networks able to generate synergies and greater visibility to ethical finance. For example, a relevant network is represented by the Global Alliance for Banking on Values (GABV). Members of the GABV must comply with a list of “sustainable banking principles”. These include the triple-bottom-line approach (“profit, people, planet”), according to which banks have to serve the community and the real economy, by focusing on long-term relationships with customers, transparency, and a long-term, self-sustaining business model.

First in Europe, in 2016 the Italian Banking Act (Bank of Italy, 1993 and subsequent updates) was updated to include the definition of ethical finance operators (Article 111 bis). A bank can be defined as ethical, in the face of potential tax benefits, if it conforms to the following principles:

- it evaluates the loans granted to legal entities according to internationally recognized ethical rating standards, with particular attention to the social and environmental impact;
- it gives public evidence, at least annually, also via the web, of the loans disbursed to legal entities, taking into account the regulations in force to protect the confidentiality of personal data;
- it grants at least 20% of its loan portfolio to non-profit organizations or social enterprises with legal personality, as defined by current legislation;
- it does not distribute profits but it reinvests them in the business;
- it adopts a governance system and an organizational model with a strong democratic and participatory orientation, characterized by widespread shareholding;
- it adopts remuneration policies aimed at limiting as much as possible the difference between the higher and the average remuneration of bank staff. The ratio between the higher and the average salary cannot in any case exceed the value of 5.

In light of the major role banks are expected to play in the development of a green finance market, the European Banking Authority has recently started to monitor new trends and developments in this area, with a semi-annual questionnaire to financial institutions. According to the results collected at the end of

December 2020, the main reasons mentioned by banks to enter into the green finance space include supporting customers' needs and strengthening client relationships, as well as the increasing relevance of corporate social responsibility, and reputational value. A high percentage of respondents made also reference to business opportunities as a result of regulatory support. However, the main barriers to entry into the green finance market include lack of data, lack of incentives, and not enough proof that "green" is more valuable or less risky than "normal" securities or loans.

Given the opportunities and the obstacles, the level of bank sustainability can vary significantly. Also banks that communicate an increasing level of responsibility and sustainability should be carefully monitored, for excluding greenwashing phenomena and fully assess the role of the intermediary in the processes of ecological transition (Scholtens & van't Klooster, 2019).

To measure the actual level of sustainability of a financial institution it is necessary to evaluate its global ESG impacts, both direct and indirect. Indeed, a bank can affect sustainable development directly, through its "day-to-day" operational activities, and indirectly, through the products and services it offers in the context of lending and investment activities.

To evaluate the direct impacts the financial institution has on the environment and society, it is possible to use indicators related to ESG factors. For the environment, for example, measures related to energy consumption, paper consumption, amount of waste, and emissions can be considered. For social issues, the evaluation can include an analysis of the community involvement and the relationship with employees. For instance, the number of investments with positive impacts on the community or the ratio between minimum and maximum salary within the organization, as well as the introduction of incentive systems based on ESG performance can be considered in the evaluation. For governance matters, it could be verified if the bank has introduced specific boards, committees, top managers specialized and dedicated to sustainability issues, as well as the analysis can evaluate the number of independent directors, the percentage of not-men at the top, the inclusion of ESG responsibilities in the Board of Directors (Birindelli, Dell'Atti, Iannucci, & Savioli, 2018).

However, to evaluate the indirect impacts produced by a bank through its lending activity and the projects it finances, the percentage of loans issued for example to the green economy, circular economy, social housing, female entrepreneurship, or the amount of microcredit can be measured. Considering the investment activities, the level of sustainability of a bank can be evaluated by

analyzing for example the policies for the exclusion of controversial sectors/countries from direct investments (such as arms sector, fossil fuel sector, or countries characterized by human rights violations), as well as the involvement of the bank in the supply of sustainable and responsible financial instruments to its customers.

The next section is dedicated to the analysis of some of the main sustainable products that a bank can offer, issue, or invest in, by focusing in particular on instruments able to play an increasingly important role in the transition to a low-carbon and sustainable economy.

Sustainable financial instruments: Green loans and ESG bonds

Banks play a key role in the development of a sustainable and green finance market, given their unique position in facilitating capital flows through their lending, investing, and advisory roles.

Indeed, other than as lenders, financial institutions can be involved in sustainable finance as responsible investors or securities issuers. Besides, they can provide consultancy or underwriting services related to sustainable and responsible financial products. For example, banks can provide their consulting services to private businesses for the evaluation of a green initiative. At the same time, they can provide to other institutional investors consulting services concerning the selection of the eligible universe for a mutual fund. In this field, the challenge for the banking industry lies in bridging the supply and demand for sustainable and responsible products and services.

In this section, two main financial instruments related to green finance are analyzed: green loans, potentially included in the asset side of a bank balance sheet, and green bonds, securities issued by several banks, but also representing a potential investment for their trading book. Another relevant product included in sustainable investing, the responsible mutual funds, are presented in subchapter 2.3.5, as they represent the main sustainable products for retail investors.

A green loan is defined as any type of loan instrument made available exclusively to finance or re-finance, in whole or in part, new and/or existing green projects. To define the eligibility of a project to be suitable for a green loan, it is possible to refer to international standards. The most widely used in the EU are

the green loans principles from the Loan Market Association, aimed at improving liquidity, efficiency, and transparency in the primary and secondary syndicated loan markets in Europe, the Middle East, and Africa. The Green Loan Principles promote the development and integrity of the green loan product and define a list of eligible green projects, in the wake of what has been defined by the International Capital Market Association (ICMA) for green bonds.

Considering the loan portfolio towards individuals and SMEs, financial intermediaries are increasingly interested in granting loans for financing also small environmental projects, such as small solar installations, LED lighting, boiler exchange, waste treatment innovations. In the same way, financial institutions are increasingly offering preferential loans for supporting green purchases, like, for example, the purchase of electric cars.

Among green loan products offered by banks, it is possible to include green mortgages and energy-efficient loans, green commercial building loans, green car loans, as well as green cards, e.g., debit and credit cards linked to environmental activities.

Nevertheless, green bonds are innovative financial instruments in which the proceeds are invested exclusively in green projects that generate climate or other environmental benefits, such as energy efficiency, sustainable waste management, biodiversity, clean transportation, clean water. They are issued to finance and re-finance assets and projects with a positive environmental contribution.

The first European green bond was issued in 2010, and since 2015 the green bond market is growing at a fast pace. Among the European countries, France is currently the main market for green bonds.

In the beginning, the green bond issuers were mainly public entities involved in environmental projects. Nowadays, the scope of green finance has expanded beyond the public spectrum and private actors are becoming more and more involved. Today corporate green bonds account for around 1/3 of the issuances, followed by bonds issued by municipalities and other sovereign entities. Among private corporates, financial institutions are the leading issuers. Commercial banks are increasingly issuing green bonds, and they are also bulking up their role as underwriters in helping other issuers to place the securities on financial markets.

In line with the European Commission Action Plan of Financing Sustainable Growth, the Technical Expert Group (TEG) on sustainable finance published in June 2019 a Report on EU Green Bond Standard, with the purpose to make it

easier for investors to identify credible sustainable investments. The report suggests the European Commission to create an EU Green Bond Standard to enhance the effectiveness, transparency, comparability, and credibility of the green bond market and to encourage the market participants to issue and invest in EU green bonds.

One of the green standards currently most used by the market has been developed by the ICMA, which formulated the Green Bonds Principles (GBP). They are voluntary guidelines that recommend clear processes by the issuers, as well as transparency and disclosure. The GBP are useful for different market participants: issuers, investors, and underwriters. They provide issuers with guidance on the key components involved in offering a credible green bond; they aid investors by ensuring the availability of information for evaluating the environmental impact of the green bond; lastly, they assist underwriters by moving the market towards high levels of disclosure and integrity, which facilitate transactions. Issuance aligned to the GBP should provide an investment opportunity with transparent green credentials (ICMA, 2021a).

In particular, the GBP framework is based on four core components: use of proceeds, the process for project evaluation and selection, management of proceeds, and reporting. Besides, it includes recommendations for the use of external reviews. According to the definition provided by ICMA, green bonds are any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible green projects and which are aligned with the four core components of the GBP.

The cornerstone of a green bond is the utilization of the proceeds of the bond for green projects, which should be appropriately described in the legal documentation for the security. The projects should provide clear environmental benefits, which have to be assessed and, where feasible, quantified by the issuer.

According to the GBP, the eligible green project categories, listed in no specific order, include, but are not limited to (ICMA, 2021a):

- renewable energy (including production, transmission, appliances, and products),
- energy efficiency (such as new and refurbished buildings, energy storage, district heating, smart grids, appliances, and products),
- pollution prevention and control (including reduction of air emissions, greenhouse gas control, soil remediation, waste prevention, waste reduction, waste recycling),

- environmentally sustainable management of living natural resources and land use (including environmentally sustainable agriculture, animal husbandry, fishery, aquaculture, and forestry, as well as preservation or restoration of natural landscapes),
- terrestrial and aquatic biodiversity conservation (including the protection of coastal, marine, and watershed environments),
- clean transportation (such as electric, hybrid, public, rail, non-motorized, multi-modal transportation, as well as infrastructure for clean energy vehicles),
- sustainable water and wastewater management (including sustainable infrastructure for clean and/or drinking water, wastewater treatment, sustainable urban drainage systems, and other forms of flooding mitigation),
- climate change adaptation (including information support systems, such as climate observation and early warning systems).
- eco-efficient and/or circular economy adapted products, production technologies, and processes (such as development and introduction of products with an eco-label or environmental certification, resource-efficient packaging and distribution).
- green buildings which meet regional, national, or internationally recognized standards or certifications.

Other than rules for the use of the proceeds, the GBP make recommendations related to the process for project evaluation and selection, as well as for the management of proceeds. According to GBP, issuers should make, and keep, readily available up-to-date information on the use of proceeds. This reporting has to be renewed annually until full allocation, and on a timely basis in case of material developments. The annual report should include a list of the projects to which green bond proceeds have been allocated, as well as a brief description of each project and its expected impact.

It is recommended that in connection with the issuance of a green bond, issuers appoint (an) external review provider(s) to confirm the alignment of their bond with the four core components of the GBP, in the form of a second party opinion, a verification, a certification and/or a green bond scoring/rating. Besides, the GBP recommend that all the issuer's processes are supplemented by an external review, to verify the selection and management methodologies, and the actual allocation of funds from the green bond proceeds.

Similar to green bonds, but with different final purposes are the so-called social bonds, securities that raise funds for new and existing projects with positive social outcomes. Social impact is the effect on people and communities. Allocation of proceeds must then be addressed to one or more social issues and benefit a target population. Also in this case, the reference framework for issuance of social bonds is the Social Bond Principles (ICMA, 2021b).

They propose a series of project categories that can be supported by the Social Bond market:

- affordable basic infrastructure (e.g., clean drinking water, sewers, sanitation, transport, energy),
- access to basic services (e.g., health, education and vocational training, healthcare, financing, and financial services),
- affordable housing,
- job creation, including the potential effect of SMEs financing and micro-finance,
- food security,
- socioeconomic advancement and empowerment.

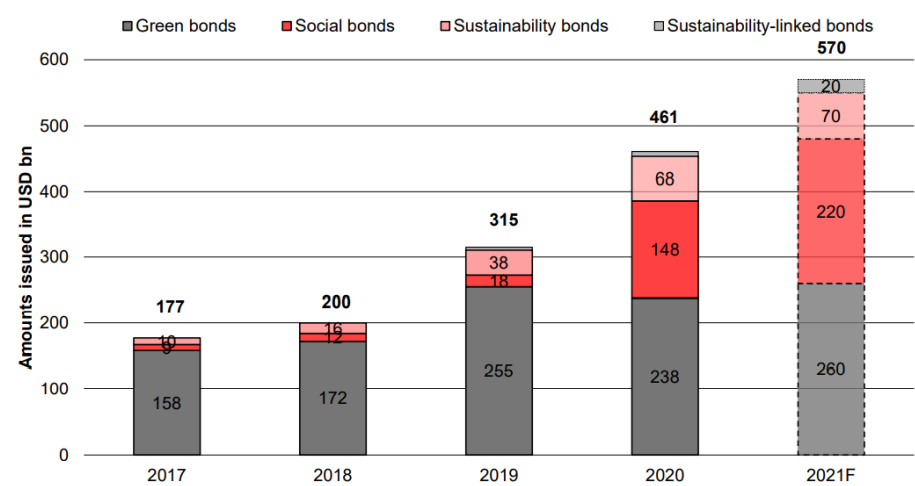
Examples of target populations included in ICMA's principles are:

- people living below the poverty line,
- excluded and/or marginalized populations and/or communities,
- people with disabilities,
- migrants and/or displaced persons,
- undereducated population,
- underserved population, with a lack of quality access to essential goods and services;
- unemployed people.

Finally, bonds that intentionally mix green and social projects are referred to as Sustainability bonds or Sustainability-linked bonds. Specific guidance for Sustainability bonds is provided separately in the Sustainability Bond Guidelines (ICMA, 2021c).

Figure 3.27 shows the global issuance of green, social, sustainability and sustainability-linked bonds. In the graph it is highlighted the prevalence of green bond issues, but also the strong growth of social bonds in the last two years. Overall, ESG bond issues have more than tripled in 2021 compared to 2017 (Dax & Krelpl, 2021).

Figure 3.27. Different kinds of ESG bonds



Source: Climate Bonds Initiative [CBI] (2020).

The markets for green, social, and sustainability bonds are still small and nascent in many countries, and this can reduce their level of liquidity. Moreover, the lack of historical data, as well as the lack of a clear understanding of structural features and risk/return characteristics of these types of bonds can limit the number of end investors interested in these issues.

From the point of view of the entities willing to originate such bonds, some limitations can derive from difficulties in identifying green assets within their balance sheet and from a potential increase in costs and risks related to the issuance of these securities compared to traditional bonds. In particular, reputational and legal risks can arise: the issuer can be accused of green-washing and this can lead to potentially higher transaction and refinancing costs.

To favor the expansion of the green, social, and sustainability bonds market, regulators must introduce common definitions and indicators to assess the “greenness” of assets and the environmental or social impact of the financed project. These standards can be initially introduced as voluntary guidelines, but after a few years of observation, they should be imposed as mandatory.

Through more robust regulation, the market for these instruments can become thicker and wider, favoring a potential virtuous circuit towards the expansion of green finance.

The role of insurance for a sustainable economy

Insurance and capital markets play a key role in the financial management of environmental risks by covering losses and supporting economic recovery with funds for recovery and reconstruction. Insurance performs economic functions (Kenneth, 1996). It has a risk transfer function from a risk-averse individual to the risk-neutral insurer and a risk pooling function because the risk is shared between a bigger number of contracts. A risk-averse insured assesses risks and the impact that their occurrence could cause on its assets.

In particular, companies could be subject to strong repercussions on their business. We will focus in particular on the risk associated with climate change and the possible loss of profitability associated with it. Insurance can also contribute to reducing the overall losses from climate change-related extreme events and can also play a strong role in encouraging preventive measures that improve resilience against the impacts of environmental events.

Insurance companies have faced a great challenge in recent years: to provide coverage for the risks associated with climate change that are becoming more numerous by interacting with the regulations of the ever-changing sector. Risk concentration will increase as climate-related losses spread: floods, property damage, and business interruptions. Global markets will be interconnected and therefore the risk of aggregation, that is the risk deriving from the fact that several parties make a claim for compensation about the same event.

Climate change is a major cause of systemic disruptions. In this regard, insurance models must be studied to take into account the growing number, the types of emerging risks, and their interactions. Insurance has developed coverage to mitigate the impact of climate risk on a company's business.

The evidence of the previous subchapters and the specialized literature offer empirical evidence of the effects of climate change caused by polluting behavior (Barrett et al., 2007). Recent studies have also analyzed the potential of insurance as regards the coverage of production losses due to meteorological events (Carriquiry & Osgood, 2012). In 2013 the European Commission published the Green Paper on the insurance of natural and man-made disasters to stimulate

insurers to manage the risks of climate change. As read in the previous paragraphs, in many countries laws have been introduced to reduce pollution that requires companies with polluting activities to bear cleaning costs. In some cases, the banks that finance polluting activities have been usually considered responsible so much that, to improve their reputation, some of them have become real promoters of investments in green assets, other institutions have decided to become real ethical banks instead.

In actuarial literature, there are models (cf. Boyer et al., 1997), where the insurance sector comes into play to cover the risk of pollution and the banking sector provides financing for “clean” activities. In some countries where transferable emissions taxes have been introduced, pollution quotas are still inadequate. Remediation costs for polluting activities are often so high that companies, on the one hand, are forced to reduce their pollutants, but on the other see the use of insurance coverage as a possible strategy. Merrifield (2001) proposes an insurance bonding approach to pollution threats. Freeman & Kunreuther (2002) present models in which private insurance can be used as a useful tool to achieve compliance with environmental policy directives.

In general, it can be said that the insurance company is considered important strategic support to reduce the risk of loss associated with the polluting company’s activity. Insurance indeed plays a vital role in helping to develop an understanding of the risk associated with climate change and in promoting measures to protect against losses caused by climate change itself.

We know that climate change causes more and more economic losses connected to natural disasters and unfortunately these variables of risks are increasing. A high number of articles highlight that belief in actions to reduce the climate change risks is possible and effective (cf. Brostrom, Hayes, & Crosman (2018) who study the self-efficacy and effectiveness of the response).

The risk mitigation measures adopted and their communication have a different impact on the perception of the risk of climate change and the measurement of their effectiveness. It is very important therefore to study credible risk reduction strategies and in this sense, the insurance sector gives evidence that it can be strong enough to have one of the first places in this game. Insurers have created and are studying innovative policies to cover both increasingly frequent risks such as fires and hurricanes and chronic risks such as the reduction of agricultural production.

The real challenge for the insurance market will be that they are not being an important player in supporting the choices of companies that will impact our ecosystem, but rather being able to be a subject that helps in risk analysis and that directs towards behavior cooperative towards the same purpose of social utility and environmental sustainability.

Sustainable insurance instruments: Some examples

Alongside the traditional catastrophe policies for damage caused by natural disasters such as earthquakes, hailstorms, floods, and water bombs, insurance coverage with greater customization is being studied today to try to make the insured aware and involved. Such a way of proceeding carries out a social function of raising awareness of risky events and involving the insured to behave proactively to reduce the risky event, in particular as regards the environmental risk (Porrini & Schwarze, 2014). The typical instrument of the insurance policies against damages for natural disasters (nat-cat) provides for compensation for the damages suffered, subject to verification by an expert; usually, contracts are where it comes insured the property and/or its contents, more exposed to risks, such as a flood or an earthquake.

The most modern evolution of these contracts is parametric policies. The default amount granted to the policyholder residing in the area affected by natural disaster does not require damage verification because the compensation is activated based on the objective measurement of a physical quantity (higher than a predetermined threshold called trigger) using dedicated technological tools (seismographs, rainwater measuring instruments, etc.). The first parametric or indexed products were developed by companies in the energy sector and commodity trading in the late 1990s. The driving factors were the increasing availability of granular, reliable, high-quality weather data, the availability of more powerful computers, and advances in modelling techniques. Thanks to these data and tools, companies whose profitability could be influenced by the atmospheric factor were now able to better understand the relationship between costs/revenues and average daily, monthly or seasonal temperatures and, consequently, to elaborate the relative models.

What emerged from these early modelling attempts was also that, in the right context, the atmospheric factor could be quantified and indexed. And based on these index values, the atmospheric factor itself becomes an object of exchange. In 1997, the first weather derivatives trading took place, and in 1999, the first

weather derivative contracts were traded on the Chicago Stock Exchange. From that moment on, companies in various sectors had financial instruments available to mitigate the volatility of the cost/income ratio associated with atypical weather conditions. The same criteria were then used to develop indexed solutions aimed at mitigating climate risks, especially those linked to natural disasters. The major innovation concerning policies linked to climate events is constituted by policies for agriculture since agriculture and the ecosystem are closely linked, as discussed in the previous subchapters.

It is often stated that agriculture is an open-air industry, and therefore, the main risk factors that can affect agricultural activity are those related to the climate and adverse weather events. The climatic factor is also an element that increasingly affects the production capacity of farms, also due to the trend of climatic phenomena in recent years. We note how on a global scale there has been an exacerbation of adverse climatic events and, in particular, how the last year was the hottest, second only to the record year of 2016. In general, worldwide, the last five years have seen an increase in the average temperature of over one degree centigrade with a simultaneous intensification of the calamitous events, not only in terms of impact but also in terms of their occurrence frequency.

Climate change, therefore, determines an intensification in the frequency and intensity of adverse events, including those of a catastrophic nature; the climatic factor is not the only element of risk that influences the performance of farms, because, like other companies, they must not be underestimated: the production risk, the market risk, the financial risk, the legal risk – institutional. It would be appropriate to tackle risk management in agriculture with a holistic approach, putting together a series of different hedging instruments for different risks and looking for complementarity between these instruments to obtain hedging as complete and effective as possible.

Mutual funds represent an innovative tool, complementary to insurance contracts, for risk management in agriculture. The logic underlying the establishment of mutual funds is to be found in an attempt to offer coverage against those risks that are too complex to be insured; author refers here to collective risks which, characterized by too high a systemic component and subjected to behavior of moral hazard, can be more effectively managed by professional organizations rather than by the insurance system. Mutuality has advantages and issues that need to be carefully evaluated before resorting to this risk management tool. The functioning of a Mutual Fund is characterized by a strong co-responsibility of farmers, thus reducing moral hazard, but even more the information asym-

metry, or two problems that negatively characterize insurance instruments for agriculture. Another aspect that makes the Mutual Funds interesting is the fact that the members could be agricultural entrepreneurs linked to a specific territorial reality and this allows to define the scope of mutual coverage according to the needs, in terms of risk management, typical of a specific production reality.

Last but not least, the presence in the risk management system of this additional instrument increases the level of competitiveness, favoring the position of farmers also in the bargaining for access to the insurance instrument (reduction of insurance premiums or proposal of better policy conditions). A Mutual Fund has limits that must be taken into account to define its field of action and fully exploit its effectiveness. The Mutual Fund, in the occurrence of several requests for compensation, proceeds within the limits of its financial resources, without prejudice to the possibility of resorting to the request for bank loans to cover the compensation to be paid.

It is important to ensure the sustainability of the system through a careful statistical analysis of the risk guaranteed by the Fund, a mutuality spread over a wide territory, and the Fund's operating rules not inspired by welfare principles but, rather, aimed at protecting the shareholders affected by major harmful events. It is evident that, however, the sustainability of the Fund could, in any case, be endangered by the systemic nature of some risks, especially those due to catastrophic disasters, especially at the beginning of the Mutual Fund's activity, when the capital raised and accumulated it may be insufficient to cover the possible losses suffered at the same time by many shareholders. The legislator can be interested in the income stabilization tool is due to three main reasons: first, the coverage of farmers is based on the key variable of interest, i.e., income, which represents the economic well-being of an agricultural enterprise much better than the revenues deriving from the production of a single good and implicitly considers the various correlations between prices and productions (Severini, Tantari, & Di Tommaso, 2016). Second, the income stabilization tool may have the potential to address systemic risks and, in particular, price risk, which is not covered by purely commercial insurance (Meuwissen, Huirne, & Skees, 2003).

Finally, the income stabilization tool supports the creation of a public-private partnership since farmers must be organized in mutual funds and must cover part of the compensation costs as well as part of the typical management costs of the funds.

There is currently extensive exploratory literature on the effects of the income stabilization tool at the level of individual farms, sectors, and countries. The

latter focuses on actuarial assessments of potential income insurance, its government costs, potential beneficiaries within the agricultural population and also includes conceptual studies on the problems of adverse selection and moral hazard in the presence of such an instrument that aims to ensure the entire agricultural income. Climatic events affect agricultural production to varying degrees depending on when they occur concerning the production cycle of crops. It would therefore be necessary to consider the consequences and effects of climatic factors in the various phases in which the entire vegetative development cycle of a given crop can be broken down.

Traditional risk management tools could be inadequate in satisfying the need to protect themselves against yield drops deriving from deviations from the agronomically considered optimal trends for each phenological phase, of variables such as precipitation, temperatures, and solar radiation. Such risks can be adequately managed through innovative index-based policies designed ad hoc for a specific crop. In particular, the parametric policy allows you to protect yourself against losses in production yield generated by the non-occurrence of a certain equilibrium between climatic variables, fundamental for the optimal development of production, such as temperature and rainfall, individually considered or aggregated with each other and with other variables such as solar radiation, or excessive heat waves.

The possibility of determining the economic loss due to damage to the quantity and quality of plant or animal production, through the use of biophysical and meteorological indices, implies the development and adoption of a model, scientifically tested, which is capable of highlighting the existence of a high correlation between the parameter taken into consideration and the damage suffered by the farmer. The subject of the policy becomes the observation of the weather trend; a trend that must be compared to threshold indices predefined ex-ante at the signing of the contract. These indices, or thresholds, are identified concerning what is considered the optimal conditions for the growth of a given crop, these optimal conditions are identified and drawn by homogeneous area and by single crop to be able to represent the risk exposure of individual farms is more transparent and precise as possible.

The analysis phases relating to the historical series available on the meteorological data and that of monitoring the parameters considered are decisive for a correct pricing method, and for the correct functioning of the indexed policy itself. The parametric policy, generally, refers to an index-linked observation of the trend of a certain meteorological event. It uses the data from the analysis of the

event considered in the contract and, upon reaching a threshold value established in the contract, insurance coverage is triggered. The compensation tends to be directly proportional to the deviation of the index from the reference value: the greater the deviation, the greater the compensation paid to the insured. A maximum deviation limit will also be established in the contract, after which the compensation is not further increased but remains constant. Different new insurance coverage has been studied ad hoc for specific production sectors. For example, in the construction sector and in general for companies which by their nature are subject to potential pollution of the ecosystem, the Pollution Legal Liability and Contractor Pollution Liability policies have been introduced on the market.

The Pollution Legal Liability Insurance (PLL) policy allows insured companies to agree on a program suited to their pollution insurance needs to protect themselves from the costs of cleaning, personal injury, and damage to third party property, which may result from the application of territorial regulations. The PLL policy is generally designed to be adapted to specific business activity and some policies also provide coverage for liability for damage to biodiversity which we discussed in Subchapter 3.4. Pollution Legal Liability (PLL) is an environmental insurance policy that provides coverage against environmental and climate risks that arise from owning facilities or running a business.

It is also a risk management tool often used in sales negotiations where the climatic risks that may occur during the negotiation in progress want to be kept under control; in fact, specific clauses can be inserted to protect both buyers and sellers from environmental risks in business interactions. The technical construction of the policy must be analyzed very well since the damage for pollution deriving from a sudden and accidental event is often covered and only legal liability towards third parties deriving from the pollution is covered. Legal liability coverage against pollution in most cases does not distinguish between sudden and gradual events and provides third-party coverage for personal injury and property damage. It also provides first-party coverage for on-site cleaning costs.

Another interesting policy is the Contractor Pollution Liability (CPL). The CPL is a contractor-based policy, offered on a claim or event basis, which provides third-party coverage for personal injury, property damage, defense, cleaning, and related costs of defense following pollution conditions (sudden/accidental or gradual) deriving from procurement operations carried out by or on behalf of the contractor.

Customize coverages are provided for specific market such as:

- general contractors,
- trade contractors,
- artisans or specialty trades.

Each market has its tolerance for risks such as residential (for the exposure to microbial matter), underground activity (for the exposure to pre-existing environmental risk, human-related or not), or environmental activity. A CPL policy protects the policyholder from the pollution conditions caused by his work and the work performed on his behalf by subcontractors. Insured exposures may include operational risks related to construction services that create environmental damage (presence of asbestos, creation of mold and bacteria, spillage of chemicals, transport of hazardous materials, incorrect disposal of materials). The key to CPL is that the coverage provided is triggered by pollution events arising out of the operations the insured contractor has been hired to perform.

When it comes to the effects of climate change, many think only of the consequences on the environment. And, instead, global warming has a strong impact, direct and indirect, also on human beings and their daily life.

Regarding the Health chapter, climate change is affecting some of the factors that play a fundamental role in human health, including air quality, safety, and supply of drinking water, availability of food, levels of nutrition in food. Extreme weather and temperature conditions, increased pollution and environmental toxins, changes in food safety are all elements that can cause physical and mental health problems.

Climate change can therefore contribute to migration, as factors such as drought and collapsing fish stocks can lead rural populations to move to urban centers.

The increase in the atmosphere of CO₂ and other greenhouse gases is not the only danger. There is also an increase in pollutants, which expose the body to several harmful consequences. Many pollutants released by burning fossil fuels are extremely toxic to all living species (such as mercury) and/or overt carcinogens (arsenic, chromium, and cadmium, for example). Furthermore, the elements that makeup smog are highly irritating to the respiratory tract and can trigger diseases such as tumors, asthma, rhinitis, bronchitis, allergies.

Many crops do not tolerate extreme heat and drought, so under these conditions, they do not develop as they should or even die. Not only. High temperatures and high concentrations of carbon dioxide promote the spread of weeds and plant diseases.

The insurance sector also plays an important role in the health sector. There are different types of health insurance, each with different coverage depending on the customer's needs, which can also be extended to family members or employees. Benefits are generally covered for each day of hospitalization and post-hospital convalescence. Sometimes they provide for coverage of lost earnings resulting from not being able to work, due to hospitalization or convalescence.

In other cases, they can compensate the beneficiary, in whole or in part, for medical expenses incurred for an accident or illness. Finally, there are types of policies for a permanent disability that provide economic compensation proportional to the degree of disability.

The health market is for the moment a consolidated market but the strong and evident impact of the climate change underway must in this case make the insurance companies reflect not so much on the type of policy (rather the categories of diseases covered will have to be reviewed) as on the role carried out by the entire insurance sector in support of a real trend reversal towards an environmentally compliant behavior.

Conclusions

Banks and insurance companies play a fundamental role in driving businesses towards eco-sustainable activities, given their ability in addressing capital and covering losses.

The most interesting key for changing the behavior of the companies and driving the transition towards a sustainable economy is the ability to help them in the analysis and management of environmental risks in a conscious way and in compliance with sustainability goals. Mobilizing capital towards the most virtuous companies, also through the definition of interest rates and insurance premiums, represents an incentive for the ecological transition of the economic system.

The *modus operandi* of ethical banks is a consolidated example of financial institutions that are born with objectives aimed at improving the social and the ecosystem. Nowadays, also more traditional financial institutions are introducing sustainability issues and ESG considerations in product and service definition, business processes, corporate and communication policies.

The financial instruments that have been developed on the capital markets (in particular green and social bonds) as well as the new insurance products de-

signed for sustainable growth (parametric-policy) constitute relevant instruments for starting a necessary process of sustainable development, in line with the Sustainable Development Goals set up by the United Nations and with the European recovery plan NextGenerationEU.

KEY TERMS

Catastrophe policies, circular economy, ethical bank, green loans, green bond, social bond, green paper, parametric-policy, Pollution Legal Liability (PLL), Contractor Pollution Liability (PPL).

SUBCHAPTER SUMMARY

Banks and insurance companies can play an important role driving the financial market towards a sustainable and responsible economy, since they can move capital flows through an environmental direction providing consultancy or services linked to sustainable and responsible financial goals.

In particular, banks can grant green loans, sell responsible investing products, such as sustainable mutual funds, green and social bonds, offer consultancy services on ESG activities to sustain environmental initiatives and projects. Insurance companies play a key role in the environmental risk management too, by covering losses with funds for recovery and reconstruction.

Banks and insurance companies are able to produce both direct and indirect environmental and social impacts. As a consequence, regulators and supervisors are incentivizing the financial institutions to encourage more responsible and sustainable behaviors of their counterparties, also including ESG consideration in their risk management practices.

While sustainable banks include ESG assessments into their traditional business, ethical banks are created with a specific social or environmental mission so that the loans granted are aimed to support a positive impact on society together with a sustainable financial return.

In this subchapter, some financial and insurance instruments related to green and sustainable finance is analyzed. First, green loans and green bonds are presented. Insurance sector instead can contribute to reduce the overall losses regarding climate change-related extreme events, legislative regimentation, healthcare thanks to specific policies. Financial institutions are expected to play a funda-

mental role in encouraging preventive measures against environmental events and cooperative behavior for a social utility. The new frontier will be a strong customization of the policies and other financial products to force the customers to be environmental compliant.

DISCUSSION QUESTIONS

1. Which characteristics make ethical banks different compared to traditional intermediaries?
2. What are green loans?
3. Describe the main differences between green bonds and social bonds.
4. Can parametric policy allow to cover cost of climate events?
5. Is a Pollution Legal Liability (PLL) an environmental insurance policy? Justify the answer.

TEACHING METHODS

- lectures,
- workshops,
- open group discussions,
- student presentations,
- gamification.

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3.8. Investments in education and training of employees

Ivica Voloder^a

LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- define the concepts of general and specific human knowledge, globalization, multinational corporations,
- categorize and differentiate the processes of knowledge and skills transfer in the corporate business environment,
- analyze the relationships related to lifelong learning and the future of jobs with regard to automation and technological change,
- understand the development of the necessary knowledge and skills required by employers for future employees.

Introduction

*... Alice asks the Cat: "Would you tell me, please,
which way I ought to go from here?"
"That depends a good deal on where you want to get to," said the Cat ...
"If you don't know where you are going any road can take you there."*

Lewis Carrol "Alice in Wonderland"

As far back as the times of Adam Smith in the 18th century, economists noticed that production depended not only on equipment or land, but also on the abilities of people. Before the 1950s, when Gary Becker first examined the links between education and income, little thought was given to how human abilities fit into economic theory or public policy. Therefore, it can be concluded that the term *human capital* was introduced at that time, which refers to the abilities and characteristics of people that make them productive. What is important for further consideration about investing in employee education and training is the fact that Becker was the first to distinguish between specific and general human capital.

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Companies are often reluctant to advocate for general human capital. Teach employees to be good software developers and they may change the company for the one that pays them the most! The situation with the specific capital is somewhat different. The specific capital arises when workers acquire knowledge directly related to their workplace, and it is difficult to transfer it elsewhere, and is often related to culture, organization.

Companies themselves have never skimped on investing in this type of knowledge and education of their employees, mostly because, as already mentioned, it is not transferable. The question that remains open is: If human capital is divided in this way, how much general human capital influences the development of specific human capital in ideal conditions, and vice versa? The most common answer to this question would be that it depends on the economic, cultural, and sociological circumstances common in a certain society, but also the motivation and developmental abilities of each individual. Firstly, there is a question: who can and who should invest in employees? Society as such through primarily general education, which extends to lifelong learning, and companies to make their employees more competitive, better and more responsible, and based on that create greater added value for the company. The synergy of these two investor categories (state and employers) in education should yield ideal results. But employees should also have motivation for further education and training. Another question that needs to be answered about this is: why? In particular, the forces which drive companies, but also employees themselves to pursue continuous education are:

- accelerating change and development of technologies (multi-disciplinarity, non-formal learning through increasing adaptability and adaptation of functionality to end users...),
- globalization (expansion of multinational corporations, knowledge/process transfer, standardization...),
- free market and competition (online information flow, copying, striving for greater and better efficiency, i.e., creating greater added value),
- job losses due to IT/automation/robotics (Luddism, productivity improvement),
- creation of new jobs in the fields that did not exist before,
- job losses due to the relocation of activities to companies where it is more competitive for companies (the process of globalization, but also the industrialization of poor countries to which production has been offshored),
- increasing specialization, but also the requirements of state regulators for certification/introduction of standards in companies/institutions.

In the following text, attention will be paid mostly to those who invest in the education of their employees. When companies do this for their employees, they organize two types of education: internal and external education. The fact is that the largest *nurseries* of new knowledge among employees are also leaders in new technologies. To the best of our knowledge, these are highly developed companies that are rapidly becoming multinational due to the consolidation of the industry, which means that they are global. In short, they are most often large corporations. They are mostly responsible for the process of globalization, which means for the education and training of employees, i.e., for the transfer of frequently used know-how.

Globalization as dissemination of knowledge and skills

The term globalization is most often considered to be the free flow of people and goods without restrictions, obstacles, barriers, etc. Observing it broadly, the greatest globalization took place from the late 19th and early 20th centuries. A huge number of people in search of a better life (fleeing hunger) from Europe, boarded ships for North and South America. They did not need a visa or even a passport. Today, this is no longer the case, especially since the COVID-19 pandemic, the movement of people has almost stopped, and fears of increasing globalization in the world economy are spreading around the world. Is it justified? The answer is neither “yes” nor “no”.

Globalization – definitions

Globalization is the process by which companies or other organizations increase their international influence or start working internationally.

Globalization is the increasing interaction of people, states or countries through the growth of the international flow of money, ideas and culture.

Theodore Levitt is known for two things: an article published in 1960 (Marketing myopia); and by his letter/resignation almost 30 years later from the position of editor of a publication that during his time became the leading magazine for business leaders and business management – Harvard Business Review. He is often credited with the notion of globalization because, in his 1983 article, he was the first to popularize (marketing) and described it as the expansion of corporations (through the opening of branches) around the world (Levitt, 1983).

Corporations that existed then and those of today can hardly be measured and compared in anything. First, today's corporations have become much larger and more global than former corporations, where the main reasons for their enormous growth are not their efficiency and quality, but the fact that almost the whole world has turned to market-oriented economy, as well as a drastic increase in the number of people on the planet (at the beginning of the 20th century there were about 1.2 billion people, whereas today's population is almost 8 billion).

In the last 30 years, many of these people, due to the market-oriented economy, have been able to work in some form for multinational corporations and to enjoy the goods that these corporations create. During the 1970s and 1980s, American corporations shut down their plants in the United States (products and businesses that no longer carried much added value), and for example opened the new ones in Mexico, where labor was much cheaper. After that, the expansion of multinational corporations moved to the Far East (primarily China). Today, such companies that were created first to provide simple products and services for American companies, are now equal to those American companies and in high technology industries present the main global competition. For example, the ideal example is Huawei, which was founded in 1987, and there are countless such examples in China. All these mostly private companies, which are today multinational companies, have developed due to their continuous development, and such development, which was reflected through increasingly competitive products, was created by continuously increasing the knowledge of their employees. On the other hand, the example of the Volkswagen Group is also interesting. During 2020, the total car sales of this group in Europe amounted to approximately 3.7 million cars, and 3.8 million cars in China (Car Sales Statistics, 2020), and approximately the same number of cars was produced in China. Volkswagen itself has definitely benefited from so much expansion and sales, and so have the citizens of China. This is the main principle according to which multinational corporations have become leaders in spreading know-how.

Multinational corporations – leaders in expanding processes and procedures

Today's corporations are not only multinational, but also global. There are almost no territories on the planet where they are not present, which is reflected in the joke that Coca Cola does not have a branch in only two countries in the world (Cuba and North Korea).

Multinational corporations today exist in huge numbers and forms (e.g., Colley, Stettinius, Doyle, & Logan, 2005), new ones are created daily, old ones disappear, each has a tendency to expand and develop, but few of them survive and live to the age of an average human lifespan. Multinational companies (those that do much of their business outside their region) employ one in 50 workers worldwide according to the latest statistics. One of the free definitions related to multinational corporations is the one that says that these are companies that generate more than 30% of their total revenue outside their home country. The problem of the definition of the home country is again vague when it comes to the example of the European Union. The home country of the corporation can be, for example, Croatia, and it can generate more than 30% of the income in Slovenia. Can we then talk about a multinational corporation? Must the income of 30% of companies based in the EU be generated outside the EU or on another continent? We put that debate aside, but the facts are as follows (*The Economists*, 2017c):

- Multinational companies affect billions of people and their lives (regarding what they watch, wear, eat, work on).
- Multinational companies own an average of about 500 different legal entities and pay an average of 10% income tax based on U.S. data.
- Multinational companies coordinate supply chains thus participating with more than 50% of world trade.
- The value of multinational companies is over a third of the value of all companies listed on stock exchanges.
- Earnings of employees of a multinational company are on average 20-30% higher than those of employees of local companies in the same country. Therefore, it is understandable that multinational companies have and can reach the highest quality (often the most educated) staff in a country.
- Companies such as IBM, McDonalds, Ford, H&M, Infosys, Lenovo, Honda, Tesla, Google, Nestle, etc., are a benchmark for managers. Multinational companies are companies that local companies copy, mostly in the know-how categories.
- Multinational companies own a huge share of intellectual property rights, for example from lingerie designs to virtual reality software and diabetes drugs.

Percy Nils Barnevik was CEO of Asea Brown Boveri (ABB) from 1988-2002. Considering his results, he was also known as the European Jack Welch (CEO of General Electric from 1981-2001, named the greatest manager of the 20th century by Fortune Magazine).

His words in ABB's description perhaps best express what a multinational corporation is: "ABB is a company without a geographical centre, without a national dominant feature. We are a federation of national companies with a global coordination centre. Are we a Swiss company? Our headquarters are in Zurich, but only 100 professionals work at the headquarters and we will not increase that number. Are we a Swedish company? I am an executive director and I was born and educated in Sweden. But our headquarters are not in Sweden, and only two of the eight members of our board of directors are Swedes. Maybe we're an American company. We report financial results in U.S. dollars, and English is the official language of ABB. We communicate in English at all high-level meetings." (Taylor, 1991).

In his days, the corporation employed 215,000 people, and the most common question to him then (and still today for all large systems) was how to organize such a large number of people spread around the world without being simple and local again? His response was: "The work of most people was organized in small units with responsibility for the financial result with a significant autonomy. At the time, their business was divided into nearly 1,200 companies with an average of 200 employees. In addition, these companies are again divided into 4,500 profit centres with an average of 50 employees."

What the future of corporations will look like no one knows, but the fact is that corporations have taken their positions in the 21st century. These large companies coordinate supply chains that make up over 50% of total world trade, and technology stars and consumer brands with strong brands continue to be successful. Several thousand companies affect what billions of people watch, wear and eat. Companies like Google, Microsoft, Netflix, Toyota, Amazon, Huawei, Samsung, etc., have become role models, but also desirable job providers.

But all of them are really afraid and worry that those employees who have crucial knowledge for the company will leave it, but also that if something happens to them, their knowledge will be lost (Leonard, Swap, & Barton, 2014). Corporations pay their employees well (better than local companies usually do in the same market), but also, more importantly, they record everything and put it into procedures and processes. There are procedures for every job not only for organizational reasons but also for the category of "knowledge loss". In addition, it is (processes and procedures) that are continuously changed, improved, refined and revised because they follow the development of the company and its evolution. This is the additional reason why they are leaders in spreading processes and

procedures in the world, that is, knowledge. However, as corporations are the main disseminators of knowledge, in every market they are the main and best employers for the best and most educated ones in the society.

Higher education as a necessity for the future

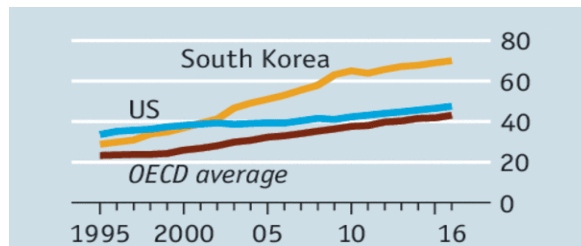
In the middle of the 20th century, having a high school diploma (in developed countries) meant something. Those who had a college degree belonged to a small percentage of the population and were appointed managers in their first job. Today, having a university degree does not have to mean anything, since it is no longer a rarity in the population, but a standard for young people in developed countries. In addition, there are several good reasons for a young person why it is good to choose to study, if only the standard of living of their family and society allows him to. Studying primarily offers the possibility of intellectual growth, better career opportunities, but also entertainment. There was another reason, which was justified as a “premium for diplomas” – an increase in the salary that they enjoyed with a diploma compared to those who did not graduate. It can be predicted that the premium will gradually decrease, that is, it will exist, but only for a rather small number of those who graduate from college and who will climb up the hierarchical ladder where they work. What the future will certainly bring new facts related to the working life of employees:

- The lifespan and working life of employed people will be longer.
- The average worker entering the world of work will change approx. 3-4 companies, and 7-10 jobs and probably two to three occupations in their 35-40 year working life.
- In the labor force population, the percentage of “white collar workers” is increasing, i.e., in developed countries today the percentage of “blue-collar workers” (manufacture worker) has fallen below 20% of total employees, which means that employees are more and more educated, and thus more productive.

The story of the society’s economic productivity and connection to education is simple: Better educated people should certainly create more and better innovations that increase productivity. As technological change places new demands on workers, it seems self-evident that a larger number of well-educated people will be needed more. But a diploma is not always the best measure of the skills and knowledge needed for a job, especially when there are a lot of graduates.

According to the OECD data³¹, an increasing percentage of young people between the ages of 25 and 34 have higher education. South Korea is a drastic example where that percentage is almost 70%, which means that employers can choose those who have graduated with honours, while paying them little. The fact is that a total of half of all the unemployed in South Korea have a university degree. That is why the competition among graduates is extremely high, and it starts very early in their lives. Suneung in Korean is a term when hundreds of thousands of young Koreans prepare for tests that will mostly define their future, whether they will enroll in good universities or maybe bad ones, or not at all. Their preparations usually last from 8 a.m. to 4:30 p.m., but many continue the preparations until 10 p.m. (Figure 3.28).

Figure 3.28. Higher education – percentage of highly educated in the population aged 24 to 34 by country



Source: *The Economist* (2018).

Lifelong learning – long-term education

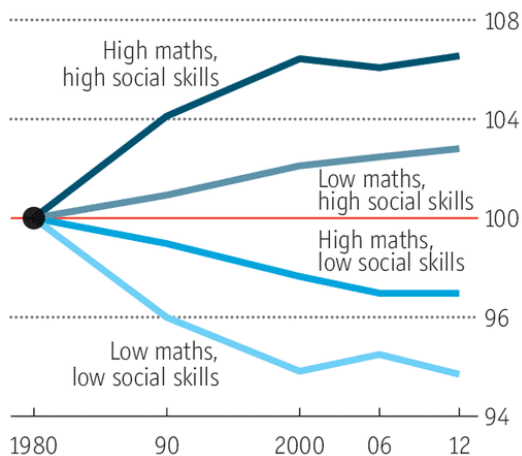
Today, compared to the past, the working life of the average person is different, and it is changing so fast that simply pushing higher education and thus completing education is not enough. People must also be able to acquire new skills throughout their careers. The return to education, even for highly qualified people, has become complex, as jobs are being phased out due to automation and technology development, and on the other hand new and more complex ones are being continuously created. In 2013 the Oxford University calculated that 47% of existing jobs in America are vulnerable to automation (*The Economist*, 2017b).

There are other trends that encourage and require lifelong learning. In the United States, the share of temporary workers, contractors, and freelancers as a percentage of the total workforce increased from 10.1% in 2005 to 15.8% in 2015. It is

³¹ <https://data.oecd.org/eduatt/population-with-tertiary-education.htm>

likely that today's youth will change jobs a lot of during the 21st century, and probably several occupations during their working lives. The question arises what should today's young people learn during their schooling, which they will need for some of the future occupations? The answer is general skills (which they will always need) and specific knowledge for a job. That is why it is understandable that today's employers are increasingly demanding that their employees have a high understanding of mathematics and logic, but it is extremely important for them to have social skills as well. These are the qualities of good employees of the future (Figure 3.29).

Figure 3.29. What skills are more or less required by employers in the United States (100 – 1980 skills requirements for employees) in the United States



Source: Deming (2017).

Retraining according to the dynamics of change

Continuing education in accordance with the requirements of the labor market is not at all easy to organize and carry out. There are several reasons for this, but the most important is probably aging, which is reflected in a loss of both psychomotoric and mental abilities of people. It is easy to say that people must continue to learn throughout their careers, but putting this into practice is a gruesome fact for many.

For example, for all those who are truck drivers today in Western developed countries and are up to 45 years old, the future of their occupations is not bright. Projections for the future are that fully autonomous driving could reduce the

number of American truck drivers by two-thirds. What to do when these truck drivers lose their jobs due to automation and technology development? Should the development of technology be blamed for their job loss, as it was thought by the Luddites³²?

Uncertainties about the speed and extent of technological change are enormous. Some fear the future because of mass unemployment. Others are pessimistic about how and whether people will have time to adjust to new challenges and jobs because if we are not able to do that, but someone else is and wants to, how will we live? What is seen on a daily basis is the companies which are adopting new technologies due to emergency, and regulators are trying to be quick and approve or ban their acceptance. What is certain is the need for new and more effective ways to develop and spread skills in the workplace. It can be stated that IT has achieved a small educational revolution in the last 20 years or so since PCs and mobile phones entered homes, whereas today's development of robotics and artificial intelligence requires another educational revolution.

The real question is: how can states respond to this problem of automation when people lose their jobs and occupations? A good answer could be given by following the example of Denmark. The Danish tripartite system is linked to employers, governments, and trade unions. Companies and unions work together to determine the skills needs of employees, who through collective agreements are guaranteed the right to paid training leave. Their famous "flexicurity" system in the country offers unemployed workers a list of 258 vocational training programs.

Another example is Singapore, where since January 2016, every citizen over the age of 25 has been able to get a loan of \$ 500 (\$ 345), which he/she freely uses to pay for one of the courses provided by 500 approved providers, including universities and MOOCs³³. Generous subsidies have been provided by the state as a measure of assistance for those over 40 and older who want to continue their education. Critics of such a policy see tax rates paid by taxpayers as a policy of pointless and unreasonable waste of money, but such critics should not be taken seriously because they have certainly never invested in themselves and their education.

³² Luddism – the Luddite movement originated in England during the 19th century and was named after its leader Ned Ludd. People who support or are part of a luddic movement are called luddites. "Crazy" machines were blamed for the mass unemployment that arose during and after the first industrial revolution (<https://en.wikipedia.org/wiki/Luddite>).

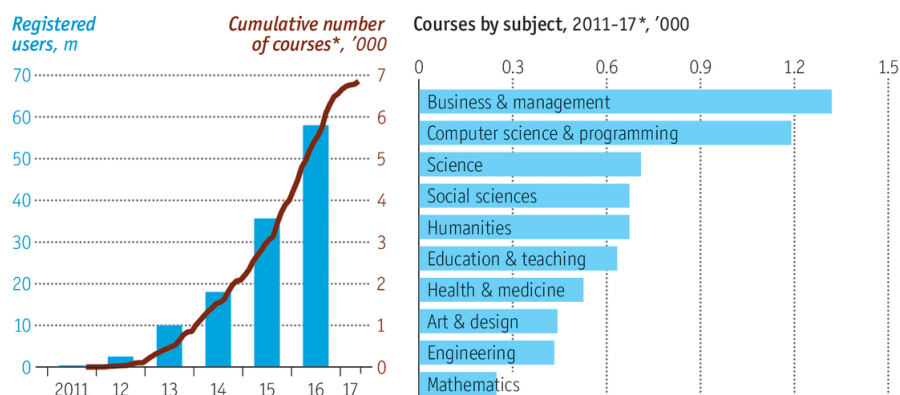
³³ <https://www.mooc.org/>

Shorter courses, lower costs and online education make it easier for people to combine work and training/education. This certainly creates new values and knowledge along with new skills. This was seen very well during the lockdowns in the COVID-19 crisis. Along with education subsidies, the task of governments around the world is to reduce licensing requirements, and not to create bureaucratic and administrative barriers that make it difficult for newcomers to enter certain occupations. Today, market and feedback report best and define mostly how good someone is or is not in a profession. It is also true that not everyone will successfully enter the market of changeable jobs. The jobs which are exposed most to the risk of technological disruption are blue-collar jobs, as workers refuse to take on less “male” roles in the fast-growing areas like health care.

Internal and external education and training of employees

Corporations have always invested considerable amounts of money in training their employees, today more than ever, and tomorrow certainly much more. A great example is AT&T, a telecommunication and media company with about 300,000 employees. Recently it has been facing two major labor-related problems. Firstly, the skills requirements in the era of large data and cloud computing are changing rapidly, and secondly, the constant departure of employees requires the company to fill 50,000 jobs a year. Hiring someone outside the company is often difficult, uncertain, expensive and often causes a bad climate and feelings among the existing employees. AT&T has therefore addressed these issues with an ambitious retraining plan for its own employees. MOOCs often help a lot. One of the first was the Khan Academy, created by Salman Khan with the goal of creating a set of online tools that help educate students. This academy creates and gives short lessons in the form of videos, and Youtube is full of similar videos today. Sebastian Thrun, the founder of another MOOC called Udacity that is being developed in partnership with Google today, predicted in an interview with *Wired* magazine that within 50 years the number of universities would be reduced to just ten in the world (Mosher, 2012). The New York Times declared 2012 the year of the MOOC. A huge number of people have used some of the introductory courses, which suggests that in the future we will have a completely new model of free university education with open access. The problem with open access courses is that they do not award any official qualification/license (Figure 3.30).

Figure 3.30. Number of MOOCs and registered users and division of courses by subject



Source: *The Economist* (2017a).

KEY TERMS

Globalization, multinational corporation, general and specific knowledge, lifelong learning.

SUBCHAPTER SUMMARY

The Subchapter defined the knowledge and skills that employers usually need and therefore invest so that employees acquire them, including the changes and forces which drive them to do so. The process of globalization is presented as a major factor in the spread of knowledge in the world, and its main promoters are multinational corporations, which, driven by a market-oriented economy, employ the highest quality and most educated staff in a society. The processes of change and dynamics in the 21st century impose the need of lifelong learning and continuous improvement on all people. The opportunities that open up for continuous learning are numerous, and there will certainly be many more in the future. What is undoubtedly a continuous variety of types of education and training for all in the society, will become an absolute normal and almost daily activity, not because of the necessity propagated by a business activity, but also because of the fulfilment of man as a rational and self-conscious being.

DISCUSSION QUESTIONS

1. Explain the concept of globalization and how it affects you.
2. Look around and at yourself and count what you see is a product made by a multinational corporation.
3. What does the term lifelong learning encompass?
4. How did you most acquire your knowledge and skills?
5. Can you predict what your occupation will be in 30 years, and how likely it is that this occupation may disappear due to automation?

PROPOSED TEACHING METHODS

- lectures,
- guided discovery learning,
- discussion,
- group/team learning.

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3.9. Bestowals and donations of goods to the underprivileged – necessary economic measures

Đurđica Jurić^a

LEARNING OBJECTIVES

After reading this Subchapter, you will be able to:

- recognize poverty indicators,
- critically assess measures to eradicate poverty,
- demonstrate and assess the effects of past activities in combating poverty in your country,
- assess the effects of tax policy in the area of donating goods to those in need in one's own country.

Introduction

Today, more than enough food is produced in the world to feed the global population, but despite that, more than 690 million people still remain hungry. Hunger affects 8.9% of the world's population. According to the Food and Agriculture

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ture Organization of the United Nations (FAO), in the period from 2018 to 2019, the number of malnourished increased by 10 million, and today there are almost 60 million more malnourished people than in 2014. According to the report of the State of Food Security and Nutrition in the World (FAO, IFAD, UNICEF, WFP and WHO, 2019) published by the FAO in 2020, the most malnourished people in 2019 were in Asia (381 million), Africa (250 million) and Latin America and the Caribbean (48 million). As many as 19.1% of Africa's population is affected by hunger, while in Asia 8.3% of the population suffers from hunger. Monitoring the trends on every continent, the authors of this report estimate that by 2030, there will be more than 50% of all people on Earth affected by hunger in Africa.

The hunger and malnutrition of a part of the world's population remains a major challenge for the governments of the most affected countries, but it is also a challenge for the United Nations and international humanitarian organizations.

Inequality is smaller, but the gap is getting bigger

Hunger and malnutrition are not the only factors deepening the gap in today's humanity – it is also poverty that does not necessarily mean hunger but significantly impairs the quality of life of a part of the world's population. It is present in every state, regardless of its wealth and the amount of gross domestic product. One part of the population is more or less poor. Reducing the share of the poor in a country relies heavily on the strategy of its government – structural change, social policy, aid to the most deprived, etc. In view of the EU countries – this is the part of the European strategy and largely depends on how individual countries use funds from the EU funds such as:

- Fund for European Aid to the Most Deprived (FEAD),
- European Social Fund (ESF),
- European Globalisation Adjustment Fund (EGF).

The use of assets from these funds must be in line with **social inclusion measures** – in particular with guidelines on the use of support to help people get out of poverty.

What does *being poor* actually mean?

Poverty as a term is most often associated with a lack of basic living conditions. A poor man is one who does not have enough money (or other material goods) to meet the material necessities of life such as an apartment (house), food, clothing, footwear, and the like.

In 1995 the United Nations [UN] (1995) adopted two definitions of poverty: absolute poverty and overall poverty.

Absolute poverty was defined as a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income but also on access to services.

Overall poverty takes various forms, including lack of income and productive resources to ensure sustainable livelihoods; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased comorbidity and mortality from illness; homelessness and inadequate housing; unsafe environments, social discrimination and exclusion. It is also characterized by lack of participation in decision making and in civil, social and cultural life. It occurs in all countries: as mass poverty in many developing countries, pockets of poverty amid wealth in developed countries, loss of livelihood as a result of economic recession, sudden poverty as a result of disaster or conflict, the poverty of low-wage workers, and the utter destitution of people who fall outside family support systems, social institutions and safety nets.

These are relative definitions of poverty, which see poverty in terms of minimum acceptable standards of living within the society in which a particular person lives (UN, 1995). But “overall poverty” goes further, recognizing the many factors that can contribute to deprivation (Mack, 2016).

Poverty indicators used in comparing and analyzing the poverty of the population of individual countries are most often based on the concept of relative poverty, which takes into account the household disposable income, the number of household members (household size) and income distribution within the population. The most commonly used indicators of poverty are:

- The at-risk-of-poverty threshold,
- The at-risk-of-poverty rate, by age and sex,
- The at-risk-of-poverty rate, by the most frequent activity status,

- The at-risk-of-poverty rate, according to the household type,
- The at-risk-of-poverty rate by work intensity of a household,
- Relative at-risk-of-poverty gap, etc.

The main indicator is the at-risk-of-poverty rate, which represents a percentage of persons with the equivalized total disposable income below the at-risk-of-poverty threshold. The at-risk-of-poverty rate does not show the actual number of poor people, but rather how many of them have an income below the at-risk-of-poverty threshold. The at-risk-of-poverty threshold is determined as 60% of the middle value (median) of the equivalized disposable income of all persons (Croatian Bureau of Statistics, 2019).

Within the European Union, research leading to collecting data for calculating poverty indicators in the member states is carried out every year. Table 3.4 (all indicators were calculated on the basis of data collected in the EU-SILC Survey) shows a comparison of the latest known data from 2019.

Table 3.4. Poverty indicators, comparison between EU countries (2019)

Country	At-risk-of-poverty rate (%)	People at risk of poverty or social exclusion (%)	Inequality of income distribution – quintile share ratio (S80/S20)	Gini coefficient	At-risk-of-poverty rate, before social transfers (%)	At-risk-of-poverty rate, pensions and social transfers excluded (%)
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
EU-27	...	...	...	...	...	...
Austria	13.3	16.9	4.2	27.5	26.2	44.9
Belgium	...	...	...	...	...	...
Bulgaria	22.6	32.5	8.1	40.8	29.6	42.2
Cyprus	14.7	22.3	4.6	31.1	22.7	35.1
Czech Republic	10.1	12.5	3.3	24.0	16.6	34.5
Denmark	12.5	16.3	4.1	27.5	23.7	38.9
Estonia	21.7	24.3	5.1	30.5	30.2	39.3
Finland	11.6	15.6	3.7	26.2	25.2	42.8
France	...	...	...	...	...	...
Greece	17.9	30.0	5.1	31.0	23.2	48.4
Croatia	18.3	23.3	4.8	29.2	24.3	41.0
Ireland	...	...	...	...	...	...
Italy	...	...	...	...	...	...

Table 3.4 cont.

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
Latvia	22.9	27.3	...	35.2	29.9	39.3
Lithuania	20.6	26.3	6.4	35.4	30.1	42.9
Luxembourg	...	...	...	...	...	...
Hungary	12.3	18.9	4.2	28.0	20.0	43.0
Malta	17.1	20.1	4.2	28.0	23.2	36.8
Netherlands	13.2*	16.5*	3.9*	26.6*	21.3*	37.4*
Germany	...	...	...	...	...	...
Poland	15.4	18.2	4.4	28.5	24.4	43.9
Portugal	17.2	21.6	5.2	31.9	22.7	43.4
Romania	23.8	31.2	7.1	34.8	28.1	45.2
Slovakia	...	...	...	...	...	...
Slovenia	12.0	14.4	3.4	23.9	22.0	39.2
Spain	20.7	25.3	5.9	33.0	26.9	44.3
Sweden	17.1	18.8	4.3	27.6	28.9	44.0

* Provisional data.

Source: Eurostat (2020).

In 2019 the highest at-risk-of-poverty rates were recorded in Romania (23.8%), Latvia (22.9%), Bulgaria (22.6%), Estonia (21.7%), Spain (20.7%) and Lithuania (20.6%), where more than a fifth of the country's population had an equivalized total disposable income below the at-risk-of-poverty threshold. The lowest at-risk-of-poverty rates were recorded in the Czech Republic (10.1%), Finland (11.6%), Slovenia (12.0%), Hungary (12.3%) and Denmark (12.5%).

The biggest percentage of people at risk of poverty or social exclusion was recorded in Bulgaria (32.5%), Romania (31.2%) and Greece (30.0%), while the fewest people in such a position were recorded in the Czech Republic (12.5%), Slovenia (14.4%) and Finland (15.6%).

The gap between rich and poor countries cannot be observed only on a global level, with the population of poor countries in Africa and Asia being most often taken as an example. The gap should also be observed at the level of the regions of individual countries (e.g., the poor south and the rich north of Italy) or within the European Union. It is important to know how far the poor population is from the poverty line, or how much income should be transferred to the poor population in order to raise household income to reach the poverty line. All with the goal: to eradicate poverty.

The pandemic caused by the COVID-19 virus further deepened poverty in 2020. The population on the African and Asian continents is particularly affected, where the vulnerability of the poor is increasing. However, the Western world has not been spared the crisis caused by the COVID-19, which is reflected in the stratification of society, with the poor becoming even poorer. Retired people, workers who have lost their jobs due to lockdown, young people who are unable to get their first job and other vulnerable groups such as the disabled and citizens in need are particularly vulnerable.

NGOs and their success

Observing poverty, hunger and the inability to meet the needs of life by a significant part of the population of our planet, one should ask how to help those in need. It is to be assumed that the governments of poor countries cannot solve this problem on their own. Therefore, this is becoming a challenge at the global level where international humanitarian organizations and non-governmental organizations have a key role to play. Non-governmental organizations are not under the jurisdiction of governments and their founder is not the state. As a rule, these are non-profit organizations that are mostly financed from donations. The most important ones are listed below, pointing out their mission and strategic decisions, as well as their achievements so far.

The United Nations launched in 1961 the **World Food Program (WFP)**³⁴ as an experimental program to provide food aid to populations affected by natural disasters and war. WFP soon expanded to help war refugees but also underdeveloped countries where famine was a major threat – especially child starvation. The first WFP development program was launched in 1963 for Nubians in Sudan. In the same year, it launched the first school meal project in Togo. Soon WFP activities outgrew food donations to the needy and expanded to social protection and education of the population of poor countries.

In 1965, WFP was included in a full-fledged United Nations program related to multilateral food aid. The flexibility of the WFP between emergency interventions and development programs in the international field of food aid can be seen in the following examples:

- during the 1970s, it delivered food to the needy in western Sahel,

³⁴ <https://www.wfp.org>

- in 1984, it shipped 2 million tons of food to famine-ravaged Ethiopia,
- in 1989, it launched the “Lifeline Sudan” operation and, in cooperation with UNICEF, dropped 1.5 million tons of food from the air into South Sudan,
- it provides financial assistance to war refugees.

In 2000, WFP adopted the Millennium Development Goals as the first global blueprint for the world free of poverty and hunger. It should be emphasized that WFP does not have an independent source of funds, but collects money and goods from governments of more than 60 countries, international corporations, economic entities from individual countries, non-profit organizations and voluntary contributions from citizens from all countries. WFP works with about 1,000 non-governmental organizations (NGOs) around the world – from small national non-profit organizations to large international aid agencies – and provides much-needed assistance to nearly 100 million people in need in 83 countries around the world.

Today, WFP is the world’s largest humanitarian organization whose activities affect the stability and prosperity of people recovering from war conflicts, natural disasters and the negative effects of climate change. It is the winner of the Nobel Peace Prize for 2020.

WFP coordinates activities with other **UN** agencies, often through the **UN Development Assistance Framework**, so that their efforts complement one another, such as the co-operation with **The Food and Agriculture Organization (FAO)**³⁵ and **The International Fund for Agricultural Development (IFAD)**³⁶. In countries where food is distributed to refugees or displaced people due to climate or natural disasters, WFP has a strong operational partnership with the UN Refugee Agency (UNHCR)³⁷.

FAO is a specialized agency of the United Nations that leads international efforts to defeat hunger. Its goal is to achieve a good food supply for all and ensure that people have regular access to sufficiently high quality food to lead an active, healthy life. With more than 194 member states, FAO operates in over 130 countries worldwide.

³⁵ <http://www.fao.org/home>

³⁶ <https://www.ifad.org>

³⁷ <https://www.unhcr.org>

IFAD is an international financial institution and a specialized agency of the United Nations whose basic goal is aimed at eradicating poverty and hunger in rural areas of developing countries.

In addition to the above mentioned organizations, the International Federation of Red Cross and Red Crescent Societies (ICRC)³⁸ – a global humanitarian organization, which coordinates and directs international assistance following natural and man-made disasters in non-conflict situations, also participates in helping and donating food to the needy. There are 190 National Red Cross and Red Crescent Societies around the world, with more currently being formed.

Donation tax treatments

Donations for humanitarian purposes can be in cash or in kind. In view of donating food to the needy, in EU countries this donation by entrepreneurs is encouraged, among other things, by tax breaks. There is also a specific type of food donation that refers to food surpluses that occur in producers and traders of food that has a short shelf life and timely donation prevents its destruction. Manufacturers cite overproduction and inappropriate storage as the most common reasons for the appearance of food surpluses. It can also be food that does not meet the specifications of the manufacturer or customer (e.g., variations in color, size, shape of manufactured products), as well as errors in production and labelling. Traders state short distribution deadlines in relation to the shelf life of food. While part of the world's population lives on the brink of poverty or even starvation – on the other hand, food surpluses arise as a result of suboptimal business. In the EU, companies donate surplus food to non-profit organizations that were established precisely as intermediaries in the chain between donors and the needy (users). In some countries, this is done by national food banks and then intermediaries are required to submit food distribution reports to end users. For example, France became the first country in the world to ban supermarkets from dumping or destroying unsold food, forcing them to donate it to charities and food banks.

In 2017 the European Commission adopted the **EU guidelines on food donation**³⁹.

³⁸ <https://redcross.eu/>

³⁹ <https://eur-lex.europa.eu/>

Tax relief for donors in relation to donated food is reflected in the following:

- food donation can be exempt from VAT with the right to recognize input tax on the purchase, i.e., production of such food,
- the value of the donation reduces the tax base when calculating profit tax (income).

Value added tax (VAT) is governed at the EU level by the VAT Directive which must be implemented into national law. In adapting the rules applicable to goods handed out for free (under Articles 16 and 74 of the VAT Directive), member states can facilitate the donation of food surplus for charitable purposes. The Commission, in line with the guidelines agreed by the EU VAT Committee, recommends that, in the determination of VAT for the donation of foods, the value of those goods should be adjusted according to the circumstances and the state of the goods at the time of donation. When food donations are made close to either the “best before” or the “use by” date or the goods are not fit for sale but can be safely consumed, these circumstances should be taken into account by member states when determining the VAT due, which could even be zero in cases where the food genuinely has no value. However, certain states have different regulations referring to VAT taxation of food donations. Belgium, Croatia, Denmark, Italy, Germany, Greece, the Netherlands, Poland and Portugal have introduced specific provisions in their own national tax legislation to address the issue of VAT in relation to food donation.

Food donation in Italy has been exempt from VAT since 1997. In Croatia, the company-donor should calculate VAT on donated food, whereby a donation of 2% of the total income of the previous year is considered as a tax-deductible expense. However, when it comes to food donations by food producers and traders to prevent their destruction, these supplies are exempt from VAT and are fully tax deductible but only if they are donated to non-profit organizations that are intermediaries in food donation and registered for that purpose. The Ministry of Agriculture of the Republic of Croatia, the authorities in Spain and Sweden have no particular provisions on VAT in relation to food donation.

Some EU member states seek to stimulate food donation by offering tax deductions. Other member states provide tax credits in support of redistribution schemes. Corporate tax incentives in place in a few Member States (e.g., France, Spain and Portugal) have demonstrated their effectiveness in encouraging donation of food surplus by industry. In France 60% and in Spain 35% of the net book value of donated food can be claimed as a corporate tax credit, meaning

that food donors are able to deduct that percentage of the value of the donated food from the corporate tax on their revenue. Portugal has in place an enhanced tax deduction, meaning that donors can deduct up to 140% of the value of the food at the time of donation, provided that the food will be used for a social purpose (such as supplying food banks) and limited to 8/1000 of the donor's turnover (European Commission, 2017). In Hungary, a donor company can use a tax relief of 100% of the book value of the donated food increased by an additional 20% (net book value), which is 120% of the value of the donated food that can be deducted from the donor's profit tax.

Different approaches to assistance depending on the recipient

Ways of donating goods depend on a number of factors: recipients of the donation, particular goods (e.g., perishable food or cans), the distance of the donor from the recipient of the donation, the way the goods are shipped (transported) to the donor, the number of intermediaries who participate in the chain donations, etc.

Food aid logistics have advanced today: from camels to cars, from road to river, by rail and by plane – including the distribution of food “from the air” to the population in inaccessible areas, areas affected by natural disasters or war. Food aid should be based on an all-including and continuous approach to target groups, taking into account the nutritional needs of the community and society. Today, certain target groups (e.g., refugees) are often paid cash instead of donations in kind to buy food on debit cards issued by individual humanitarian organizations or to distribute food vouchers which can then be redeemed in stores with which these humanitarian organizations have signed an agreement.

Donation of goods is also possible through the so-called social shops, soup kitchens or food banks. In doing so, it is important to ensure a fast and efficient donation chain with as few intermediaries in the chain as possible so that costs in non-governmental organizations (non-profit organizations) are as low as possible.

For example, WFB uses a standardized market for trading and acts like a real bank. Long-shelf food products are kept in reserve at strategic locations around the world and are available for purchase at a time when food is needed to normalize instability in the local market where food shortages have occurred due to market inefficiencies, environmental problems or humanitarian crises. Donation

of food to the poor through the redistribution of surplus food is present in various models in the world today – from direct donation to the socially disadvantaged to the organization of so-called food banks that mediate between donors (food producers and traders), charities and the population in need (beneficiaries). Table 3.5 shows the results of a survey on the amount of redistributed food in several countries.

Table 3.5. Data on food redistribution in EU-28

Country	Tonnes	Year	Source
EU	781,000	2019	FEBA
EU	411,000	2014	FEBA
Austria	11,100	2014	Pladerer et al. (2015)
Netherlands	20,000	2013	Bos-Brouwers et al (2015)
Nordic countries	900	2013	Hanssen et al. (2014)
Great Britain	20,000	2014	WRAP 2015

Source: Stenmarck, Jensen, Quested, & Moates (2016, p. 31).

Within the EU, it can be seen that in the period from 2014 to 2019, food redistribution increased by 90%. In the Nordic countries it was very low unlike in the UK. It can be concluded that it is necessary to educate citizens and companies not to throw away surplus food but to donate it. It is in this area that the role of food banks is significant.

Food banks are non-profit, humanitarian organizations whose purpose is to collect surplus food from producers and traders and distribute the food thus collected to those in need.

The first food bank, the St. Mary’s Food Bank, was founded in 1967 by John Van Hengel in Phoenix, Arizona. In Europe, the first food bank was founded in Paris – “Paris-Ile de France” in July 1984. However, soon there was a need to create a single body to represent food banks at European level, and so on September 23, 1986 the Fédération Européenne des Banques Alimentaires (FEBA) was established, with the headquarters in Paris. In 2018, FEBA moved to Brussels. Today, FEBA comprises 24 full members who are either national organizations or national food banks and five associate members⁴⁰.

⁴⁰ www.eurofoodbank.org

Project approaches to bestowals and donations

Practice has shown how effective donations or funding programs are when a number of different partners enter a project. This can be the case, for example, with merging funds and charitable sources or merging non-profit organizations with partners who donate goods (farms, food industry, retail chains, etc.). Donating goods to the poor cannot be spontaneous but organized, so it is necessary to have a project approach to donations from the point of view of collecting goods from donors and distributing goods to those in need.

A non-profit organization entering a food collection project should clearly define the title of the project at the beginning (e.g., “Homemade fruit tree in kindergarten”) so that potential partners can get clear information about the project and the potential benefits of donating their products to a non-profit organization which will distribute them to users. In this case, the benefits for donors – producers or traders would be in terms of tax relief. For this purpose, it is necessary to describe the basic meaning of the project and present its structure:

- problem (explanation of need),
- goal of the project,
- achievement of goals, i.e., operational goals,
- group or part of the society for which the project is intended (beneficiaries),
- target group (those whose activities will be affected by the project),
- implementation – project strategy (activities, participants, time plan),
- evaluation of work, results, organization, etc.,
- opportunities for further project maintenance or similar activities after the completion of financial support,
- planned budget.

A timely observed and determined problem justifies the project, above all. It shows that it is important and necessary to support the project. It is therefore important to inform potential project partners about this. There is no need to confuse the goal and values for which the project is to be implemented. The goal should be a certain change in the situation, realistically achievable in the foreseeable future – in the previous example, it would be to provide the required amount of fresh seasonal fruit from nearby orchards to kindergartens as soon as possible. And what is the value of that project? The value is to donate fruit to

children whose parents have a lower purchasing power and to allow nearby fruit growers to donate fruit that is “surplus” (e.g., small apples, gnarled pears, etc.) without VAT and that this is also a tax deductible expense, thus leading to the decrease of the profit tax base.

Projects planned in advance and well-organized projects for donating goods – especially food to the needy, can be very effective and should be encouraged, especially at the national level.

Assistance that helps the poor the most in the long run

The 2030 Agenda for Sustainable Development, including the 17 Sustainable Development Goals (SDGs), comprises global objectives that succeeded the Millennium Development Goals on 1 January 2016. The SDGs will shape national development plans over the next 15 years. From ending poverty and hunger to responding to climate change and sustaining our natural resources, food and agriculture lies at the heart of the 2030 Agenda⁴¹.

The population of developing countries can no longer rely solely on food donations from the developed part of the world. It must, with the help of the developed countries, use them as its own flywheel and start production for its own needs. In order to achieve this, they need help in road construction, irrigation, infrastructure and primarily investment in education.

Nevertheless, developed countries should make some efforts to educate all stakeholders in the process of donating goods, which includes, i.a.:

- educating companies about corporate philanthropy and the importance of donating,
- informing donors systematically about new incentives for donation,
- using tax exemptions related to donations as incentives,
- educating businesses and consumers about the need to reduce food waste.

It is especially important to educate the population about responsible behavior towards food surpluses. At the country level, collection centers or food banks should be provided where food surpluses will be collected. Likewise, states should encourage food producers not to destroy products that deviate from standard quality but to distribute them to those in need – whether it is donated

⁴¹ <http://www.fao.org/sustainable-development-goals/en/>

food or food sold in social shops at low prices, which can sometimes justifiably be below the cost of production.

KEY TERMS

Food donation, food bestowals, poverty, food bank, poverty, taxes.

SUBCHAPTER SUMMARY

Today, more than enough food is produced in the world to feed the global population, but despite this, more than 690 million people still remain hungry. The hunger and malnutrition of a part of the world's population remain major challenges for the governments of the countries most affected, but it is also a challenge for the United Nations and international humanitarian organizations. Reducing the share of the poor in a country relies heavily on the strategy of those governments – structural change, social policy, aid to the most deprived, etc. In view of the EU countries – it is a part of the European strategy and largely depends on how individual countries utilize funding from the EU funds such as: Fund for European Aid to the Most Deprived (FEAD) European Social Fund (ESF), European Globalization Adjustment Fund (EGF). Especially valid in the redistribution of surplus food are food banks whose most important task is to collect food from donors and distribute it to the needy. The European Union countries encourage food donation through tax relief for donors in the form of VAT exemption on donated food, but with the right to recognize input tax on its purchase, i.e., food production and reduce the income tax base by the value of donated food.

DISCUSSION QUESTIONS

1. What is the difference between absolute poverty and overall poverty?
2. How do states encourage food donation with their tax policies?
3. What is the world's largest humanitarian organization and how does it work?
4. What are the advantages of a well-organized goods donation project?
5. What are the ways of donating goods?

PROPOSED TEACHING METHODS

- lectures,
- guided discovery learning,
- discussion,
- group/team learning.

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Firstly, according to relevance, the main issue of the modern economy is to move rapidly towards sustainability. In this book, the authors present the main areas of this transformation, by describing threats to our day's economy in three aspects and providing solutions that should serve as instruments in the transformation process. The importance of this coursebook is that one publication discusses the basic knowledge of sustainable economy that is needed by students, teachers, and practitioners seeking to objectively understand how to make the future more harmonious.

Secondly, the publication is designed based on the guidelines of such studies. Chapters are written by different authors, but the structure of every chapter is unanimous. The structure of the coursebook, where objectives are stated at the beginning of each chapter and questions are formulated at the end, helps the reader to master the main aspects more precisely. The objectives presented at the beginning of each chapter are consistently implemented throughout the book. The description of various business instruments indicates the wide range of knowledge required. This encourages the reader to seek new knowledge independently as the process of transformation will never end. The book is written clearly, and easy-to-understand information is provided. The terms are defined by using the latest sources and taking into account the topicalities of the modern economy. The terminology and symbols in the book are consistent with the terms and symbols used in other publications. The publication is full of diagrams and tables, which help to visualize the phenomena being explained.

The final conclusion – this coursebook is an excellent teaching and learning tool for teachers, practitioners, and students to understand the peculiarities of the age of the economy of the XXIst century.

From the review by Assoc. Prof. Dr. Giedre Lapinskiene
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