

CHAPTER 9

Sustainable Development and Environmental Literacy

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Sustainable Development

Environment is a whole of interactions in nature (Buckingham & Turner, 2008). Environment is the environment where all living and non-living things live together in a balance that needs to be protected (Erten, 2012). With the existence of human beings on earth, they started to live in a relationship with their environment. The relationship between human and environment has continued in various ways from ancient times to this day. Human beings have lived all their individual and social life in relationship with their environment from the time they first existed on earth until today. While this relationship was initially in the form of meeting the needs necessary for survival from the environment, it has continued in different ways as needs, expectations and desires have changed over time. In the early times, the strong and superior party in this relationship was the environment. Human beings are aware that they need the environment. In this context, he accepted the superiority of the environment. However, from past to present, this acceptance has been replaced by an effort to establish dominance. Over time, living conditions, needs and desires have changed, and as a result of this change, man has shown a desire to dominate nature, that is, his environment. As a result of this situation, he tended to use his environment more (Hughes, 2016).

From the beginning of history to the present day, human beings and the environment have been two elements that cannot be separated from each other. Human beings have sustained their existence through a close relationship with their environment. Human beings have been affected by the environment throughout their lives and have affected

their environment with their activities. While this interaction was in the form of meeting the compulsory needs such as shelter and nutrition required for human survival from the environment in the early times, over time this relationship has turned into a relationship in which humans harm the environment (Khagram et al., 2010). Changing living standards of individuals, competition between individuals and societies, and rapid industrialization steps taken without fully considering the consequences have contributed to the destructive effect of this relationship (Li, 2018). With the change of the era, the advancement of time, the changing needs and expectations of individuals and the increase in the population, especially in the process that started with the industrial revolution, the impact of human beings on the environment has become destructive and this situation has made it necessary to bring the issue of environmental protection to the agenda at the global level (Mensah & Casadevall, 2019).

The current environmental destruction has reached serious levels when urbanization and population growth are added to the negative effects of the steps and practices taken by societies without thinking about the future for the purpose of industrialization. The high levels of environmental destruction have supported the idea that intervention is now necessary. Although many environmental problems brought about by environmental destruction initially existed regionally, it was understood that the effects of these problems would be felt throughout the world over time. Thus, societies realized that regional solutions were short-term and temporary solutions and started to look for solutions to problems on a global scale (Liu et al., 2018). In particular, with the mechanization process that started with the industrial revolution, a large number of people who believed that they would have better job and living opportunities migrated from their villages to cities, increasing and accelerating this migration system that has always existed. Due to this situation, serious population growth has started to be experienced in cities. With this migration movement, the need for nutrition and shelter of the increasing population in cities has also increased. Depending on the housing needs of the increasing population, cities have started to grow as settlement areas. This situation has led to an increase in the use of fossil fuels, reduction and destruction of agricultural areas, forests and green areas (Okumuş & Okur Akçay, 2020).

In the current century, the environmental destruction caused by unconscious steps taken with the impact of industrialization, urbanization and rapid population growth has reached high levels, bringing with it concerns about human health and the future of the planet. As a result of the destruction of natural life and the unconscious use of resources, many deadly problems such as hunger, disease and poverty have started to emerge in some parts of the world in connection with food and water shortages. In addition to these, changes in the climate, destruction of the ozone layer and global warming have begun to threaten the world's present and future. When it was realized that the Earth would lose its status as a habitable planet if this trend continued, solutions began to be

sought. Upon the realization that these problems will threaten not only a certain region but also the whole world in time if no measures are taken, solutions have started to be sought on a global scale. With the realization that solutions to these problems could only be found if every individual, every society and every state living on Earth acted together in cooperation by taking certain responsibilities, states came together in international conferences and started to produce solutions. As a result of the efforts to protect our planet today and tomorrow, the concept of Sustainable Development came to the agenda (Du Pisani, 2006; Paul, 2008).

Before moving on to the definitions of sustainable development, the concepts of “sustainability” and “development” should be mentioned separately. It is known that the concept of sustainability first appeared in the “World Charter for Nature” adopted by the World Union for Conservation of Nature (IUCN) in 1982. The concept of sustainability is a word that is used in many fields and disciplines today and expresses the capacity for continuity and a certain process. In the World Charter for Nature, the concept of sustainability means ensuring the continuity of the organisms, environment, atmosphere, land and water resources that individuals benefit from during their lives in a way that does not harm the ecosystem (McNeely & Miller, 1983). The concept of development, on the other hand, refers to the attempts made to make individuals or societies better than their current situation. The concept of development is a broad concept that covers all the efforts made for the positive development of the economic, social and cultural structure of societies (Neumayer, 2012).

Since sustainable development is used by many different sciences and disciplines, there are different definitions in the literature. The concept of sustainable development has been interpreted in different ways by many different audiences such as disciplines, governments, businesses and environmentalists due to its broad scope of meaning and the fact that it is a field that depends on many different factors (Giddings et al., 2002). Many definitions of sustainable development have been made over time and have been accepted by certain circles. Among these definitions, the one that is still valid today is the definition made by the World Commission on Environment and Development (WCED). In 1987, the World Commission on Environment and Development (WCED) defined the term sustainable development in the report entitled “Our Common Future”, also known as the Brundtland Report, named after Gro Harlem Brundtland, Prime Minister of Norway at the time. In the relevant document, sustainable development is defined as meeting the needs and requirements of the present in a way that does not eliminate the capacity of future generations to meet their needs (WCED, 1987).

Another widely accepted definition of sustainable development is that of the United Nations Environment Program (UNEP). UNEP defines the concept of sustainable development as the realization of practices aimed at improving living standards in a way that does not adversely affect natural life and systems. Another definition of sustainable

development belongs to the International Union for Conservation of Nature and Wildlife (IUCN). The International Union for Conservation of Nature and Natural Resources defines sustainable development as a term that means respecting nature while meeting the needs of individuals and not taking more than the planet's capacity to renew itself. When the literature is examined, it is seen that there are different definitions made by different commissions and organizations. The common point of these definitions is that the concept of sustainable development does not refer to development in a single field. Although sustainable development represents a multidimensional structure, if it is desired to be explained in the simplest way, it refers to the continuity of developments and changes in the elements of economy, environment and social life in relation to each other (Sachs, 2012).

Sustainable Development from Past to Present

As time progresses, the effects of changing living conditions on natural life and the environment have not been positive. Especially with the effect of rapid population growth with the industrial revolution, individuals used nature as if it were an unlimited resource. During and after this period, the long-term effects of many steps taken by individuals in the name of industrialization on the environment were not considered and short-term economic profit was focused on. Unconscious use of natural resources, rapid population growth, wrong production and economic policies have caused the natural balance to deteriorate. The negative impact of these destructive human behaviors on the environment has started to be felt over time. As a result of these environmentally unfriendly behaviors, many problems such as environmental pollution, difficulty in providing clean water, famine, hunger, global warming, ozone layer destruction, destruction of habitats, extinction of some species, extreme weather events have emerged and reached serious dimensions. The negative effects of these problems have increased over time and evolved into global problems that threaten humanity and the planet. It has been realized that environmental problems, which initially emerged regionally, will become global problems over time. The increasing severity of environmental problems and their consequences has caused concern for the future (Fischer et al., 2012). With the increase in environmental concerns, solutions have been sought at the global level. The acceleration of the process of our planet becoming an unfavorable environment for the continuation of human life has necessitated intergovernmental cooperation. When it was realized that environmental problems could not be prevented by individual or regional efforts and that governmental and societal action was necessary, the search for international solutions to this issue began. One of the comprehensive concepts put forward as a solution proposal in this search process has been the concept of sustainable development. The emergence and acceptance of the concept of sustainable development is based on the idea that development initiatives in environmental, social and economic dimensions should be continuous and in the interaction of these three dimensions. Based

on this idea, improvement practices have been worked on, targets have been set, reports have been presented and international agreements have been signed (Emas, 2015; McNeill, 2004).

Sustainable development as an idea is actually a proposed solution to end the situation in which our planet is no longer able to offer a healthy future. The concept of sustainable development has been identified and accepted as a solution to increasing environmental and health problems, as well as increasing economic concerns and distrust in the justice system, decreasing people's confidence in a healthy future, and ending the trend of our planet becoming an unfavorable environment for the continuation of living species (Hopwood et al., 2005).

The first indication that sustainable development is a necessity and a need is seen in the book "Silent Spring" written by Rachel Carson in 1962. In this book titled Silent Spring, it is stated that humans are destroying nature day by day and it is emphasized that if this situation continues, natural resources will become unusable. In the book, the researcher predicted that if this negative situation continues, our resources will run out and our planet will become an unfavorable environment for living life (Keitsch, 2012). The foundations of sustainable development on the basis of international cooperation were laid at the United Nations (UN) Stockholm Conference in 1972. At the conference, which was held with the participation of many developing and industrializing countries, it was emphasized that living in a healthy and sustainable environment is the right of all individuals. The conference emphasized the importance and necessity of international action and cooperation for the protection of the environment. At the end of the conference, the Stockholm Declaration consisting of 29 articles was published. With this declaration, the foundations of environmental cooperation were laid on an international platform. The UN Stockholm Conference is the first conference to address the concept of environmental protection on the international platform with the participation of different states. Although the term sustainable development was not officially included in the conference, the sharing of environmental concerns and worries on a global platform and the search for solutions to these problems in cooperation formed the basis of the concept of sustainable development (Handl, 2012). In the same year, a report entitled "The Limits to Growth" was published by a strategy development center called the Club of Rome. The report emphasized the impossibility of unlimited growth with limited resources and highlighted the negative consequences that would occur if global problems continued at this rate. The predictions of this report on development and the environment have reverberated around the world. The report is one of the first studies to examine the interaction between the environment and world economic policies. The report is also known as the building block of the green economy approach. In the report titled Limits to Growth, the emphasis that the relationship between environment and economy should be included in development plans and strategies is interpreted as an emphasis on

the necessity of sustainable development policies, even though it is not included as a concept (Nørgaard et al., 2010).

The first organization to address the concept of Sustainable Development on a legal platform was the World Commission on Environment and Development (WCED) established by the UN General Assembly in 1983. In the report titled “Our Common Future” published by the Commission in 1987, the definition of the concept of sustainable development was included. In this report, sustainable development is defined as “meeting the needs of the present in a way that does not jeopardize meeting the needs of future generations”. The report mentions four basic steps of sustainable development. These steps are listed as future generations, basic needs, resources and poverty reduction and prevention. With this report, also known as the Brundtland report, it is emphasized that it is important and necessary to ensure its continuity as well as production and management in various issues ranging from environmental concerns and concerns, social and social themes, economic policies and management strategies. The report includes the principles that a sustainable development approach should adopt. These principles are;

- Ensuring that growth is active and qualified,
- Providing basic needs such as employment, shelter, health, water, food and energy,
- To ensure that population density is kept at a sustainable level,
- Ensure the protection and enrichment of natural resources,
- Ensure risk management,
- Ensuring that technology is driven,
- Ensuring the integration and consideration of the relationship between environment and technology in decision-making processes, are listed as (Holden et al., 2014; UN, 1987).

The Brundtland Report contains the principles of sustainable development and the arrangements to be made to realize these principles. The report is the first in terms of addressing sustainable development on an official platform for the first time. A management system that effectively involves individuals in the decision-making process, a sustainable, safe, productive and technical economic system, a social system that can solve problems arising from unsustainable development initiatives, production policies that respect the ecological system, a continuously developing technological system, an administrative system that can remain flexible and up-to-date, and finally an international system that encourages and supports sustainable economic and trade policies are among the arrangements included in this report for the realization of sustainable development principles (Brundtland, 1987; Brundtland, 1989).

The next step in the international discussion of sustainable development was the

United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil in 1992. 178 countries participated in the conference. The United Nations Conference on Environment and Development (UNCED) is also known as the “Rio Conference”, “World Summit” and “Earth Summit” in the literature. This conference was held on the 20th anniversary of the Stockholm Conference and the aim of the conference was to evaluate the 20-year process and to produce solution strategies for current problems. The conference emphasized the importance of social sustainability, which is one of the main components of sustainable development. The Conference emphasized the necessity of shaping legal regulations and economic policies according to the principles of sustainable development. As a result of the conference, 5 documents were published. These are Rio Declaration, Agenda 21, Convention on Biological Diversity, Forest Principles and Climate Change Convention. Of these documents, Agenda 21 and the Rio Declaration are particularly related to sustainable development. Agenda 21 is also known as the “21st Century Agenda”. This document aims to examine the interaction between development policies and environmental policies and to ensure that the environmental problems that exist today are not carried into the future. This document is an action plan for sustainable development. The Rio Declaration provides a general perspective for sustainable development. In this document, the interaction between human and environmental rights is emphasized and the duties and responsibilities of governments on these issues are included (Sneddon et al., 2006; Weiss, 1992). The Kyoto Protocol is one of the implementation instruments of the UN Framework Convention on Climate Change, one of the five declarations issued as a result of the Rio Conference. The Protocol was signed in Kyoto in 1997. The aim of the Protocol is to reduce the anthropogenic greenhouse effect by controlling greenhouse gas emissions and to protect our planet against the negative effects of two global disasters, namely increasing global warming and climate change. The Kyoto Protocol is one of the leading steps taken to prevent the greenhouse effect and global warming. Although this protocol is not directly related to sustainable development, it is also important for the sustainable development process as it is one of the most important agreements made to ensure the sustainability of the planet (Maamoun, 2019).

The next step was the World Summit 2, which took place in 1997 at the United Nations General Assembly with the participation of 165 countries. This summit is also known as the Rio+5 Summit. The purpose of this summit was to evaluate the 5-year process after the Rio Conference. The purpose of the World Summit 2 is to evaluate and discuss the extent to which the decisions taken at the Rio Conference have been implemented, how useful they have been and the current status of the steps taken for sustainable development. In this conference, in which the extent to which the goals discussed in the Rio Conference were realized, the reasons for this failure and preventive measures were discussed, it was concluded that there was a slight improvement in developed

countries, but the problems continued in underdeveloped and developing countries, the improvement required by the decisions taken as a result of the Rio Conference was not realized, and it was emphasized that more concrete steps should be taken to achieve the principles and principles of sustainable development (Ayre & Callway, 2013).

The next international step in sustainable development was the United Nations Millennium Development Summit held in New York in 2000 under the leadership of then UN Secretary General Kofi Annan. Organized with the participation of 189 countries, this summit is also known as the “Millennium Summit”. At this summit, 8 “Millennium Development Goals” planned to be realized until 2015 were determined. These 8 goals put forward as a result of the summit are very important in terms of determining the main dimensions of the understanding of sustainable development. The 8 goals called the Millennium Development Goals;

- Minimizing hunger and poverty globally,
- Ensuring the right to basic education for all individuals,
- Ensuring that women’s status in society is enhanced by ending gender discrimination,
- Prevent child mortality and reduce the global child mortality rate to the lowest level,
- Implementation of efforts to improve maternal health,
- To carry out efforts to combat and prevent epidemics,
- Ensuring environmental sustainability,
- Collaborating with governments at the global level for development (Lomazzi at al., 2014).

A report called the Millennium Development Report was published in 2015 to assess how successful the goals have been in the 15-year period that began with the setting of the Millennium Development Goals. According to the Millennium Development Report, in this 15-year period, there has been a decrease in the number of poor individuals worldwide (from 1.9 billion to 836 million), a decrease in the number of individuals who cannot receive basic education (from 100 million to 57 million), a decrease in the number of individuals with malnutrition in developing countries, a 50% decrease in the number of child deaths, a 45% decrease in maternal mortality, a decrease in malaria-related deaths (6.2 million people were saved from death and treated), and an increase in the number of individuals with a daily income of 4 dollars or more (approximately tripled). According to this report, 2.6 billion people were provided with drinking water during this period. While the statistics in the published report point to some improvements, at the global level this is not enough. Too many individuals still struggle with hunger, poverty, access to clean water and epidemics. Even if the rates are decreasing, there are still high rates

of child mortality and maternal mortality. In 2015, the “2030 Agenda for Sustainable Development Goals” was published as a continuation of the Millennium Development Plan after it was determined that the Millennium Development Goals could not be achieved with full efficiency (Diaz-Sarachaga et al., 2018; Halisçelik & Soytaş, 2019).

The next stop in the historical journey of sustainable development was the United Nations Johannesburg Summit (World Summit on Sustainable Development) (Rio+10), which took place in 2002 with the participation of 104 countries, private sector and non-governmental organizations. The purpose of this summit was to evaluate the process from the Rio Conference in 1992 until 2002. At the summit, the achievement of the goals set 10 years ago at the Rio Conference was analyzed and the necessary implementations were determined and planned. The Johannesburg Declaration and the Johannesburg Implementation Plan were published as a result of this summit. The implementation plan includes targets to be achieved by various years. The fact that not only state leaders but also non-governmental organizations and private sectors took part in this conference is very important in terms of the adoption of the understanding of sustainable development by all circles. In this context, it was emphasized that sustainable development is a global responsibility (Von Frantzius, 2004).

The United Nations Summit on Sustainable Development (Rio+20) held in Rio de Janeiro, Brazil in 2012, 10 years after this conference, is the next stop in the historical process of Sustainable Development. In this conference, the status of achieving the sustainable development goals and targets of the previous conferences was discussed and global cooperation was called for in this process. Appropriate planning was made by determining what needs to be done to achieve the goals and the strategies that are missing or faulty in the process of preventing environmental problems. At the end of the conference, a declaration entitled “Future We Want” was published. The declaration consists of 283 articles prepared under the themes of political determination, our common vision, green economy for the prevention of poverty and hunger in the process of sustainable development, theoretical framework of sustainable development, implementation framework of sustainable development and implementation methods. This declaration is very important in the sense that its articles are directly based on the understanding of sustainable development. This declaration, called The Future We Want, is a guide in terms of specifying what needs to be done for the future of a society that has adopted a sustainable development approach. The emphasis on sustainable development is clearly seen in all the articles in the declaration (Bartelmus, 2013; Nhamo, 2014).

The next important international conference in the historical period of sustainable development is the United Nations Summit on Sustainable Development, which took place in New York in 2015 with the participation of 193 countries. In 2000, the Millennium Development Summit resulted in a significant achievement of the goals set, but this achievement was insufficient in solving or preventing problems at the global level.

Published in 2015, the Human Development Index data proves this situation. Human Development Index data show that the Millennium Development Goals have been a serious success from 2000 to 2015, but when the performance in terms of achieving the goals is evaluated on a global scale, it is understood that it is insufficient to bring the expected solutions to the economic, social and environmental problems it faces. For this reason, the Summit emphasized the necessity of setting sustainable development goals that are inclusive and provide solutions to the current problems of our world in the light of the experiences gained from the sustainable development process initiated with the Millennium Development Goals. In this summit, the reasons for the partial failure of the goals published in 2000 were discussed and efforts were made to achieve global success. In this context, as a result of the summit, the 2030 Sustainable Development Goals (SDG 2030) were set under the name “Transforming our world: the 2030 Agenda for Sustainable Development”. Adopted with the signatures of 193 countries, SDG 2030 consists of 17 core goals. These 17 goals were developed to compensate for the failure of the Millennium Development Goals, and when these goals are analyzed, it is seen that a balanced and indivisible emphasis is placed on the three basic dimensions of sustainable development: environment, society and economy, and a more holistic approach is displayed. This global agenda envisages that by 2030, countries should shape their development plans and strategies in the context of these goals. With the goals and targets set, the world has been informed of the determination to promote practices in areas of critical importance for the planet and humanity by 2030. What is meant by these areas are the factors necessary for people to live in a peaceful, equal, healthy and prosperous world and to have a healthy and sustainable environment. These 17 themes are presented below (Assembly, 2015; Pedersen, 2018; Zimon et al., 2000).

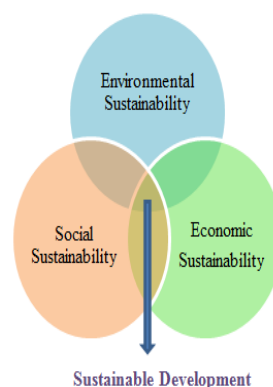
- Goal 1. To end all forms of poverty wherever it exists
- Goal 2. End world hunger, promote sustainable agricultural practices, ensure food security and good nutrition
- Goal 3. To ensure that individuals in all age groups have a healthy life and to encourage individuals to live a well-being life
- Goal 4. Providing inclusive, equitable, quality education and lifelong learning opportunities for all individuals
- Goal 5. Achieving gender equality, strengthening and supporting the position of women and girls in society
- Goal 6. Ensuring access to clean water for all individuals and supporting sustainable water management
- Goal 7. Ensuring that all individuals have access to affordable, sustainable, reliable and modern energy systems

- Goal 8. Promote decent work, full and productive employment and a sustainably developing economy for all individuals
- Goal 9. Promoting innovation, building resilient and robust infrastructure, and supporting inclusive and sustainable industrialization
- Goal 10. Preventing national and international inequality across the globe
- Goal 11. Transforming settlements into robust, inclusive, sustainable and safe areas
- Goal 12. Ensuring sustainability in production and consumption policies
- Goal 13. Ensuring cooperation to combat global climate change and its negative consequences
- Goal 14. Ensuring the conservation and sustainable use of the resources of the oceans and seas for sustainable development
- Goal 15. Protecting all ecosystems and forests, making improvement arrangements, ensuring sustainable management, preventing desertification, land degradation and loss of biodiversity,
- Goal 16. Building inclusive and peaceful societies for sustainable development, ensuring justice, and supporting transparent, inclusive and effective institutions
- Goal 17. Promote global cooperation for sustainable development and keep implementation tools up to date (Vinuesa et al, 2020).

As is evident in the historical journey of the concept of Sustainable Development, this concept is possible by ensuring the continuity of social, environmental and economic sustainability at the same time and in a balanced manner. In the light of this information, the concept of sustainable development has taken the form adopted today. This three-element balance model is known as the “Three Pillars - People, Planet, Profit” and the “Three E’s Balance Rule - Environment, Ecology, Equity/Equality and Economy/Employment” (Figure 1).

Figure 1.

Three Pillars Model



According to this balance model, sustainable development has three main dimensions: society, environment and economy. Sustainability in each of these dimensions should be achieved simultaneously. The area where these three main dimensions intersect is the area where sustainable development is realized (Dalampira & Nastis, 2020; Flint, 2013).

Main Components of Sustainable Development

The understanding of sustainable development has three basic dimensions: society, economy and environment. The area where sustainability in these dimensions intersect expresses the understanding of Sustainable Development. In the understanding of sustainable development, the dimensions of social/societal sustainability, environmental sustainability and economic sustainability are in a simultaneous and balanced continuity.

1. Sustainable Economy

In traditional, classical economics, what is important is the market's ability to allocate resources efficiently, so resource depletion is ignored. At this point, it is not usual for environmental concerns to be included in the classical understanding of economics. In contrast to this understanding, resource depletion is an important issue for the economy in sustainable systems (Goodland, 2002).

All over the world, especially after the industrial revolution, the environment and natural resources have been used excessively and unconsciously to ensure economic growth and development. This use has led to an increase in the rate of depletion of resources and the inability to renew them, bringing with it a lot of serious pollution and health problems. So much so that these problems have become so risky that they threaten humanity and our planet. In this context, in order to solve this problem, international studies and collaborations have been initiated for the global acceptance of environmentally friendly economic systems by abandoning classical traditional economic methods. With these developments, it is aimed to take measures and find solutions for existing problems. As a result of these studies, the concept of sustainable economy has been adopted with the emergence of the concept of sustainable development. In contrast to the classical, traditional understanding of economy, what is meant by sustainable economy is an understanding of economy that has longer-term, global goals and is environmentally oriented (Barrier, 2017). The depletion of resources is one of the most important issues for a sustainable economy. Due to this possibility, sustainable economic systems support renewable natural resources as resources and build the economic system around these resources. Activities such as recycling the energy and materials used and bringing them back into the system, using less raw materials and materials in the provision of services and products, preferring the materials that cause the least damage and least pollution to the environment in the system, reducing the waste rate by recycling the waste materials generated during the production processes are some of the most basic practices of sustainable systems (Vivien, 2008).

Economic sustainability is based on the relationship between humans and nature. One of the most important international agreements that emerged as a result of global cooperation in this field is Agenda 21. Agenda 21 is one of the five declarations published as a result of the World Summit and is known as the action plan of the sustainable development approach. Agenda 21 emphasizes the necessity of organizing economic systems and policies within the framework of sustainability in addition to ensuring social and environmental sustainability in order to achieve the goals and objectives of sustainable development. Some of the articles of the Agenda 21 document on sustainable economic systems are presented below. These are;

- Minimizing environmental problems caused by production technologies and economic strategies, planning policies in a way that does not harm the environment,
- Transforming production and consumption policies into sustainable systems,
- Planning economic and environmental policies on the basis of mutual benefit (Walshe, 2011).

In sustainable economic systems, environmentally friendly and controlled use of all kinds of resources used in the formation, distribution and consumption processes of products and services is essential. It is a requirement of a sustainable economy that economic policies, production and consumption models, state and private sector institutions are structured on the basis of long-term use by adhering to the principles and objectives of sustainable development and taking social responsibility. In sustainable economies, economic activities are obliged to consider future generations while meeting the needs of individuals and societies, planning debt management and formulating investment policies. Economic sustainability is inextricably linked to social and environmental sustainability. Economic sustainability also shows the limits of economic growth (Reddy & Thomson, 2015).

2. Sustainable Society

Social sustainability refers to the equal and equitable satisfaction of the needs and requirements of all members of society without discrimination. Social or societal sustainability is the capacity to provide all individuals with needs such as security, health, education and housing at a welfare level. For a society to be sustainable, the individuals who make up the society must live in prosperity and have a productive, healthy and stable structure (Tobón & Luna-Nemecio, 2021).

If there are negative situations such as inequality in income distribution, increase in health problems, dissatisfaction and unrest in a society, the short-term relief and improvement provided by temporary solutions to these problems is not sustainable unless continuity is ensured. In sustainable societies, individuals have equal living conditions and fair income distribution. Unemployment, lack of education, poverty, problems in

the health system, unsafe and uninhabitable settlements and an unfair justice system are important obstacles to the sustainability of a society. The social dimension of sustainable development addresses issues related to improving the living conditions and standards of present and future generations. In this context, all elements required for a better quality of life constitute the social dimension of sustainable development. It aims to ensure global prosperity, peace and tranquility by contributing to the development and positive change of all segments of society (Mi & Coffmann, 2019).

For a sustainable society, there are various duties for all individuals and certain rights and freedoms that must be provided to all individuals. Some of these include

- Ensuring gender equality in all societies,
- Ensuring social justice for all individuals,
- Equal treatment of all individuals on earth without discrimination,
- Ensuring the right to education for all individuals around the world,
- Ensuring that all individuals around the world benefit equally from health systems,
- Creating safe and healthy residential areas for all individuals on earth and ensuring that they live in peace in these areas,
- Ensuring that all individuals around the world benefit equally from social services,
- Improving the well-being of all individuals and societies,
- Ensuring cultural diversity in all societies,
- Ensuring respect and sensitivity to social life,
- It is listed as taking responsibility at individual and social level for a sustainable society (Altuntaş, 2012; IUCN, 1991).

3. Sustainable Environment

Today, with the rapid increase in the world population, it is a fact known by all individuals that natural resources are limited and should be used cautiously. We have pushed the capacity of our planet to its limits due to unconscious environmentally hostile behaviors that have been practiced in the past and are still being practiced today. For this reason, it is of serious importance that every decision taken or every step to be taken is realized with future generations in mind. In this context, it is an individual and social responsibility to use systems that do not harm natural systems and ensure the sustainability of water and soil while meeting the needs of today's people. The requirement of a sustainable environment is that all living things continue their lives without diminishing the resources of future generations (Morelli, 2011).

What is meant by sustainable environment is that we can offer a livable environment to future generations by improving the current environmental conditions. The most basic solution to this idea is to minimize our negative impacts on the environment. In this context, some practices that need to be done to achieve a sustainable environment have been identified. Some of these are;

- Careful, limited use and protection of our planet's natural resources,
- Ensuring the sustainability of biological diversity, protecting species in danger of extinction,
- Reducing carbon dioxide emissions from anthropogenic sources,
- Encouraging and expanding the use of renewable energy sources,
- Encouraging tree planting, protecting and increasing forest areas,
- Taking measures to prevent all kinds of environmental pollution,
- Recycling of used materials and wastes back into the system,
- Implement measures to reduce the increase in global warming and thus avert a global climate crisis,
- Supporting environmentally friendly activities and organizations,
- Increasing the number and effectiveness of institutions and organizations for environmental protection and development,
- Ensuring the preservation of the historical texture,
- Reducing the ecological footprint on a global scale (UNESCO, 2006).

Ensuring the sustainability of the environment can be expressed in the most basic sense as keeping the rate of depletion of our natural resources lower than the rate at which the planet can renew itself, but it also includes keeping all practices that harm natural systems under control. For a sustainable environment, the capacity of the ecosystem should not be exceeded and biodiversity should not be harmed while meeting the needs of individuals. The prerequisite for sustainable development is a sustainable environment (Sutton, 2004).

A sustainable environment, economic system and social structure are the three main dimensions of sustainable development. The area where these three fundamental dimensions intersect shows us the area of sustainable development. Well-educated individuals are the most basic and effective way for the sustainable development approach to achieve its goals and objectives and to be adopted as a lifestyle for individuals. In this context, education is the key to the full realization of sustainable development. In order to emphasize the necessity of education for sustainable development, the period between 2005 and 2014 was declared as the “Decade of Education for Sustainable

Development” by the United Nations. The main goal of this decade is to ensure that all individuals acquire the knowledge, attitudes, values, behaviors and skills necessary for a sustainable future (Teksöz, 2014). Considering that a sustainable environment is a prerequisite for sustainable development, the importance of the quality and effectiveness of environmental education emerges. In 1977, the definition and aims of environmental education were determined in the Tbilisi Declaration published at the Intergovernmental Conference on Environmental Education organized in cooperation with UNESCO and UNEP. In this declaration, environmental education is defined as “the education given to individuals with the aim of raising awareness, knowledge, sensitivity, positive attitudes and skills on environmental issues, supporting the necessary motivation to develop environmentally friendly behavior, and enabling them to produce ideas and solutions for environmental problems” (UNESCO, 1978). When the definition of environmental education in the Tbilisi Declaration is examined, it is seen that the definition is made in the context of environmental literacy. In this sense, it would be correct to think that the aim of environmental education is to raise individuals as environmentally literate individuals. The main purpose of environmental education, which is the basic point for sustainable development to achieve its goals and which should be provided to all individuals, is to ensure that all individuals are raised as environmentally literate. In this context, environmental literacy is a necessity for a sustainable life and future. Because only environmentally literate individuals can ensure the realization of the prerequisite of sustainable development by ensuring the sustainability of the environment.

Environmental Literacy

Although literacy as a term was known in the past as a word expressing only the ability to read and write, today it refers to the state of having deeper and more comprehensive knowledge on the relevant subject. In this context, this concept has become quite different from its origins in the past. The scope and domain of the concept of literacy, which was known as the ability to communicate with written or printed symbols between individuals in the past, has developed and changed over time. Especially in recent years, in order for an individual to be called a literate individual, he/she should have a high comprehension capacity, be able to make informed decisions, be sensitive and aware of his/her environment, and exhibit a solvent attitude towards problems and problems (McBridge at al, 2013).

Environmental literacy is one of the types of the concept of literacy, which expresses the state of having much more skills than reading and writing skills in the age we are in. The concept of environmental literacy is one of the most important concepts in environmental education literature. It is known that the first emergence of the concept of environmental literacy was an article written by Charles Roth in Massachusetts Audubon in 1968. This concept has been defined in different ways by different researchers over the years. Therefore, there are many different definitions in the literature (Disinger & Roth, 1992).

Environmental Literacy as a Concept

The oldest and most general definition of the concept of environmental literacy is the level of personal environmental knowledge and awareness present in individuals. The term environmental literacy refers to the interactive link between individuals and natural systems. Individuals who establish a sustainable connection with their environment are defined as environmentally literate individuals. In this context, the concept of environmental literacy is defined as the existence of knowledge, attitudes, skills, motivation and awareness of the environment and environmental problems in a balanced and holistic manner (Roth, 1992; Wright, 2006). Environmental literacy is not simply a matter of creating awareness. It is to develop in-depth and meaningful knowledge, environmentally friendly behaviors, sensitivity and emotional dispositions towards the environment. The environmental literacy model developed by Simmons (1995) is known as one of the first model attempts developed within the scope of the North American Environmental Education Association. This environmental literacy model addresses the goals for environmental education in the Tbilisi Conference, the Belgrade Charter, and the environmental education program prepared by Hungerford et al. in 1980 with a holistic approach (Köklü Yaylacı & Feriver, 2020).

Environmental literacy is a comprehensive understanding of the interactions and relationships of individuals and societies with their environment. In this context, an environmentally literate individual is expected to understand and evaluate the effects and functions of practices and activities in all fields such as technology, culture, science, agricultural activities on natural systems, that is, the environment, and to be an individual who strives for a sustainable environmental structure. While defining environmental literacy, Roth (1992) emphasizes observable environmentally friendly behaviors. According to Roth (1992), environmental literacy is the ability to transform environmental knowledge into behaviors and to exhibit these behaviors (Morrone et al., 2001; Hernandez, 2005; Moseley, 2000).

When Roth (1968) defined environmental literacy, he also identified the characteristics that an environmentally literate individual should have. These are;

- Knows that social and natural systems are interrelated. Understands that this relationship is bidirectional, that is, systems are affected by and affect each other.
- Knows that human and nature are a whole that should not be considered separately.
- Knows the effects of developments in science and technology on natural systems.
- Knows that what needs to be learned about the environment is not a periodic but a lifelong process.

Ramsey (1987) mentioned some characteristics that an environmentally literate individual should have. According to Ramsey (1987), an environmentally literate individual;

- Have sufficient understanding and success in environmental activity strategy development, planning and implementation.
- Be sensitive to the environment.
- Have awareness of the positive or negative effects of individual and social behaviors on the environment.
- Have a negative attitude towards all kinds of behaviors that will harm the environment.

Disinger and Roth (1992) emphasized in their study that environmentally literate individuals should have the knowledge, environmentally friendly behaviors, beliefs, attitudes and skills necessary to recognize and prevent environmental problems. Morrone et al. (2001) stated that environmental literacy cannot be mentioned unless environmental knowledge is transformed into environmentally friendly behavior and attitude. Loubser et al. (2001) identified the characteristics of an environmentally literate individual that should be observed. According to Loubser et al, characteristics of an environmentally literate individuals;

- They have sufficient knowledge about the environment.
- They can recognize and understand our planet and feel responsible for it.
- They should find solutions to what they see as problems in the world and contribute to their personal environment. Make serious, personal decisions about environmental issues, if necessary.
- They have knowledge about natural resources and natural systems. Recognize renewable and non-renewable resources. Have knowledge about environmental problems and solutions.
- They should be able to share their knowledge with the individuals around them. If necessary, they should carry out informative studies. They should know the interaction of social components such as culture and politics with the environment.

Components of Environmental Literacy

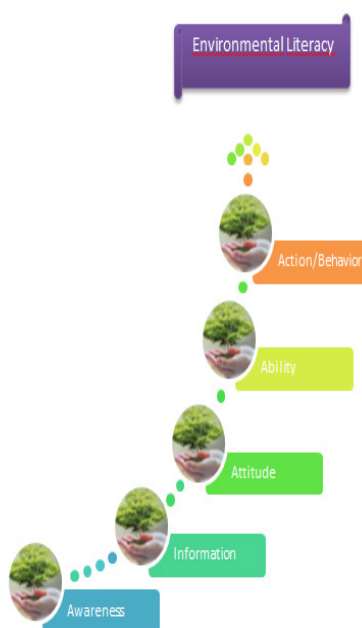
Over time, many different researchers have tried to identify the components of environmental literacy. Willis (1999) listed the components of environmental literacy as knowledge, emotional disposition, motivation and skills. According to Hsu (1997), the components of environmental literacy are sensitivity, awareness, attitude, skill, active participation and knowledge. According to Caha (2000), the triad of knowledge, skills and attitude constitute the components of environmental literacy. These three basic areas contain the values that individuals should have. Ruchter (2007) stated that environmental literacy has many components. According to Ruchter (2007), knowledge, attitude, value, interests, norms, self-confidence, perceived behavioral control, behavioral desire, and

behavior are some of these components.

Although the definition of environmental literacy as well as its components are interpreted differently by different researchers, researchers have reached a consensus on the boundaries of environmental literacy. Based on this idea, five basic areas have been identified as the components of environmental literacy with a general opinion. These five basic areas are awareness, knowledge, attitude, skill and action, respectively. The main purpose of environmental education is to raise environmentally literate individuals. In order to raise environmentally literate individuals, all individuals must be successful in these five basic areas. In the absence of any step, environmental literacy cannot be mentioned. However, in the case of the presence of these five basic areas in the individual, the individual can be characterized as an environmentally literate individual, and the goals of environmental education can only be achieved by raising environmentally literate individuals and bringing them into society (Figure 2) (Elder, 2003).

Figure 2.

Five Key Domains of Environmental Literacy



Among these components, awareness can be defined as individuals being aware of the events and situations that occur in their daily lives. In the concept of awareness, attention is consciously focused on an event, flow or situation. In a state of awareness, an individual acts consciously, knowing the causes and consequences of a situation or event. For example, when it comes to the environment, the individual is aware that global warming is a serious problem. In the information stage, the individual has a basic understanding of the environment and the problems related to it. At the attitude stage, individuals show a set of values, a sense of concern for the environment, and motivation to actively participate in its improvement and protection. In the abilities stage, individuals gain practice for the experiences gained in the previous stages. Individuals at the behavioral,

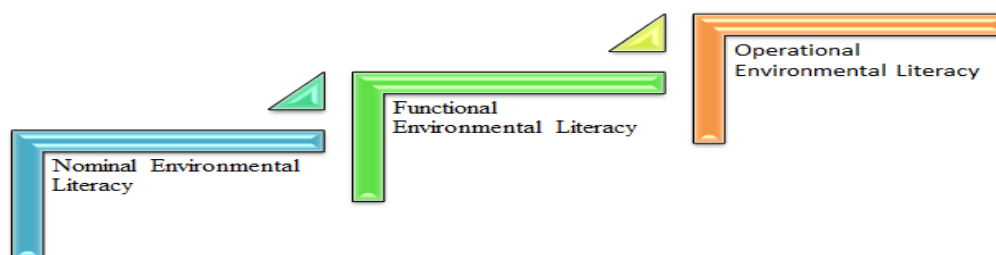
action stage, which is the most difficult and final stage of environmental literacy, adopt and exhibit positive behaviors towards the environment (Elder, 2003; UNESCO, 1978).

Over the years, different researchers, groups and organizations have worked to achieve the main goal of environmental education, which is environmental literacy. One of these efforts belongs to the National Project for Excellence in Environmental Education (NPEEE). This project, which is realized in the USA, carries out a large number of studies to create various standards in environmental education. According to the standards set by NPEEE, there are certain characteristics that an environmentally literate individual should have. These are listed as asking and analyzing questions, knowing environmental issues and natural systems, being aware of and understanding environmental problems, and taking responsibility individually and collectively to improve the environment (Benzer, 2010).

Environmental Literacy Levels

Environment and human beings are two elements that cannot be separated from each other. These two elements are in an interaction that complements and completes each other. Looking at the behaviors of the individuals who make up the society, it is observed that some individuals are aware of the importance of this relationship, while the other half of the society is not very aware of this relationship. In this sense, observable behaviors are very important for environmental literacy. In this context, environmental literacy dimensions were determined based on observable behaviors. These dimensions are listed as Nominal Environmental Literacy, Functional Environmental Literacy and Operational Environmental Literacy from basic to advanced (Figure 3) (Loubser at al., 2001).

Figure 3.
Levels of Environmental Literacy



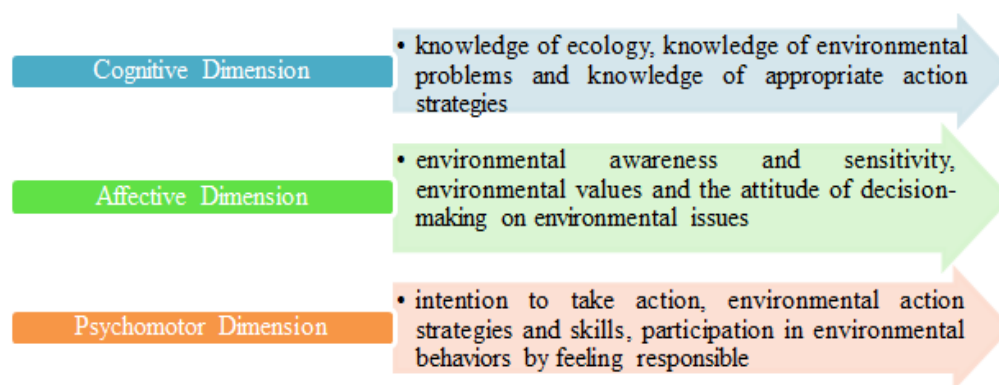
Nominal Environmental Literacy is the most basic and first level of environmental literacy. Individuals with this level know the concepts related to the environment and the meanings of these concepts. They begin to develop awareness and sensitivity towards nature and natural systems at the initial level. Functional Environmental Literacy is the second level of environmental literacy. Individuals at this level have the skills and ability to make sense of the relationship between the environment and humans. Individuals have a deep understanding of the structure and functioning of natural systems and their

relationship with humans. They have knowledge about the problems and solutions that will occur according to the nature of the interaction between the environment and humans. They share this knowledge with other individuals. Operational Environmental Literacy is the highest level of environmental literacy. Individuals with this level have turned environmentally friendly behaviors and ideas into a lifestyle. Behaviors and actions for the benefit of the environment are at the forefront. Individuals at this level have the environmental knowledge required for a sustainable environment and the ability to transform this knowledge into behavior. They take responsibility for environmental issues and actively participate in environmental activities to inform the rest of society. For individuals at this level, the understanding of environmental literacy is integrated into every moment of life and is adopted as a lifestyle (Cutter & Smith, 2001; Goldman et al., 2006).

As mentioned before, the ultimate goal of environmental education is to ensure that all individuals are raised as environmentally literate. In this context, Liang et al. (2018) determined the cognitive, affective and psychomotor dimensions of environmental literacy and the components of these dimensions in their study (Figure 4).

Figure 4.

Cognitive, Affective and Psychomotor Dimensions of Environmental Literacy



The researchers identified knowledge of ecology, knowledge of environmental problems and knowledge of appropriate action strategies as the components of the cognitive dimension. The researchers listed environmental awareness and sensitivity, environmental values and attitudes towards making decisions on environmental issues as the components of the affective dimension, and identified intention to act, environmental action strategies and skills, and participation in environmental behaviors by feeling responsible as the components of the psychomotor dimension.

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