

## MANAGEMENT OF SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL PROTECTION

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***Abstract.** Unifying the concept of social, economic and ecological development, the new development paradigm was established under the name of sustainable development. Sustainable development should harmonize sensible consumption of natural resources with their protection and ensure a more equitable division of wealth and equal economic development at the global level. Within such a context, science and environmental education constitute the precondition for our joint future. As regards the contents, this paper provides a precise and comprehensive overview of theoretical features of environmental pollution and sustainable development, as well as the most important aspects of environmental and natural resource management. For effective control of environmental pollution to be possible, it is necessary to consider the ethical foundations of environmental economics in particular, and special attention is paid to in the paper. A significant part of this work is devoted to criticism of uncontrolled economic growth and the inefficiency of the state in controlling environmental pollution. Knowledge management for the purpose of sustainable development and development of international regulations on the environment are also included.*

**Keywords:** Sustainable development, management, environment, pollution

### 1. Introduction

The Brundtland report defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Sustainable development policies include institutional measures and measures and activities in the field of environmental protection that protect the environmental system, the economic and social system as a single unit, as well as a set of principles of economic and social sustainability. Institutional measures include the areas of good governance, access to information, the fight against corruption and supervision over the implementation of measures and activities. Measures and activities in the field of environmental protection refer to the integration of the environmental protection dimension into development programs and projects in the programming or design phase, as well as monitoring the achievement of goals in this area. Measures in the field of economic sustainability refer to various sectors - energy, forestry, agriculture, water management, and others. Measures in the area of social sustainability include poverty reduction, gender, cultural and social policy, cooperation with the civil sector, and others. If development is to be sustainable in the long term, economic and sustainability

policies must be harmonized with institutional arrangements, measures and activities in the field of environmental protection.

What is sustainable development? Sustainable development represents a general direction, an aspiration, to live in a world in which economic, technological and cultural development is harmonized with the needs of the development of society and the capacity of the environment.

The World Commission on Environment and Development in the report "Our Common Future" indicates the danger, for people and our planet, of the policy of economic growth without taking into account the possibility of regeneration of the planet Earth. In 1987, this commission defined sustainable development as development that meets the needs of the present without denying future generations the ability to meet their own needs. Sustainable development is a long-term concept that indicates the need to create a balanced relationship between three seemingly opposing areas that must ensure environmental responsibility, economic profit and a society of equal opportunities in the future. This concept of sustainable development represents progress for environmental policy, because it explains the connection between environmental, economic, social and cultural problems within which environmental protection problems should be considered (conservation of natural resources, biodiversity, circulation of matter, emissions of harmful substances, sustainable use of land, timely and effective problem solving, aesthetic value of nature), if we want to solve them professionally and in a socially acceptable way.

### **1.1 Problem, subject and object of research**

The rapid growth of the population in the last hundred years, the strengthening of the economic activity of mankind, the development of international trade, and the increasing needs of mankind for energy and material goods, have had, and will continue to have, negative consequences on the quality of the environment. Ecological problems have taken on dramatic proportions because they directly affect people's health and threaten the survival of life on Earth. Harmful ecological and economic consequences for the environment are manifested not only in the area of pollution and depletion of natural resources necessary for life, but also in the area of a complete reduction of the quality of the environment in certain areas where life and economic activity cannot continue.

The economic prerequisite has already reached or exceeded important limitations related to the source, that is, to the natural capacity of the country. Parts of the Earth have already been damaged or destroyed, so there is practically no place where traces of human existence cannot be noticed. From the center of Antarctica to Mount Everest, waste materials dumped by humans can be clearly seen, and the quantities are increasing. It is not possible to find a sample of ocean water without seeing traces of human waste. Toxic substances and compounds of heavy metals have already accumulated within the marine system, and one fifth of the world's population breathes air more toxic than the standard recommended by the World Health Organization (WHO).

In the eighties of the last century, it became obvious that environmental degradation has become one of the main obstacles to economic development. Economists of environmental economics, a new scientific branch of economic sciences, assume a significant role in considering the mutual effects of economic growth and environmental quality. By means of environmental protection policy, they try to integrate the solution of environmental issues. Through the economics of the environment, economists strive to express the functions of the environment in monetary terms in order to be able to show the mutual relationship between the goals of economic policy and the goals of environmental protection policy.

## *MANAGEMENT OF SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL PROTECTION*

In such an environment, the concept of steady or sustainable development was created. Accepting such a conception of development, the economy must be trained for a new organization in relation to the use of natural resources and new state economic and environmental protection measures. The economy must set new goals for environmental protection, but also anticipate and reduce the negative consequences of state policy in environmental protection. In such new environmental conditions, the economy has to deal more with research and development projections, taking into account the growing interest in environmental protection.

In order to achieve this, it is necessary to investigate basic environmental problems, mutual influences of economic growth and environmental quality, as well as the impact of environmental protection policy on economic growth. As environmental protection is an expensive activity, it is necessary to find an objective measure of environmental pollution, so that the costs for environmental protection are lower than the benefits of economic growth. At the same time, it is necessary to know the entire economic-ecological instrumentation that is available for environmental protection policy.

Although for a long period of time current phenomena are scientifically studied and current problems of environmental pollution are solved on a global scale and numerous institutional and instrumental activities are undertaken. All these activities are undertaken with the aim of affirming and operationalizing the idea of global sustainable growth and development of all activities and encourage the management of sustainable development, which would be directly in the function of creating basic assumptions for the creation of individual and social well-being. The described issue and the determined problem of the research on the current phenomena of the relationship between management and sustainable growth and development determined the scientific framework for the subject of the research as a project task: To investigate the current theoretical and applied phenomena of the principles, instruments, laws and theories of sustainable development, systematically formulating the results of the research on the causes and the consequences of global environmental pollution, the most important determinants of environmental management, the mission of educational systems in global sustainable development, the legal framework of sustainable development management, and concludes the management of sustainable development in the 21st century.

The problem and the subject of the research refer to two interconnected objects of research: management and sustainable development.

### **1.2 Hypothetical framework**

Research problem, subject and object of research, the purpose and goals of the research on the current phenomena of the relationship between management and sustainable development, to which this work is dedicated, determined the scientific paradigm for the hypothetical framework:

**The main hypothesis** is the hypothesis of knowledge and skills about the most important pollution of the environment, sustainable development, management, about the legal framework of sustainable management development, management of sustainable development, which represent the creation of a basic reference for looking at the management of sustainable development for the 21st century in all activities.

The main hypothesis set in this way included several auxiliary hypotheses:

1. Scientifically based knowledge about the causes and consequences of global environmental pollution and the mission of ecological policies and ecological systems in global sustainable development represent a theoretical framework for the study of numerous current phenomena of sustainable development management.

2. Knowledge and understanding of management in general, and especially the functions and specifics of environmental management, enable the management of all potentials, resources and capacities in all activities and the creation of basic assumptions for global sustainable development.
3. Good knowledge of the most important pedagogical meanings of educational systems represents a scientific paradigm for the ecological education of children, students, students and adults in the system of lifelong learning and education, but also for the appropriate management of knowledge in the function of global sustainable development.
4. An adequate amount of knowledge and understanding of legal rules and legal institutes, national, international, coercive law, autonomous law, directives and recommendations of the European Union, declarations, programs, and environmental documents enables not only environmental managers but also others: teachers, scientists, politicians, entrepreneurs, intellectuals, experts of various professions, to create basic assumptions for micro, macro and global sustainable growth and development.

### **1.3 Purpose and goals of the research**

The goal of the research is closely related to the previously determined research problem. Based on the review of ecological and economic problems of environmental pollution and the determination of the interaction between economic policy and environmental protection policy, the need to involve environmental economics economists is determined to solve environmental problems. It wants to prove that only a new philosophy of development can ensure smooth and sustainable development.

Accordingly, the new role of the state and companies in environmental protection and the function of management in environmental protection are investigated. The purpose is to draw the attention of the holders of the state environmental protection policy to the need for an effective fight against environmental pollution, providing them with information on the international environmental protection policy in developed countries and countries in transition. As the state's environmental protection policies are based mainly on environmental taxes and incentives, and these on damage assessments and benefits from environmental protection, it is desired to provide a framework for the objective determination of environmental damages, i.e. setting an environmental protection policy and the development of environmental management.

Bearing in mind the aforementioned and the fundamental mission of this work, the purpose and goals of the research were determined: to investigate the increasingly important meaning, principles, rules, instruments, phenomena about the most important problems of sustainable development management and to define the research results and present them in this paper.

### **1.4 Evaluation of previous researches**

The first serious study by R. Carson called *Silent spring* (*Silent spring*, New York, 1962) scientifically indicated the endangerment of flora and fauna and the problem of human survival on Earth. In that study, the environmental problems of our planet are pointed out, but economic growth is not discussed in detail.

The economic aspects of the environment are also covered by P. Nijkamp in the book *Theory and Application of Environmental Economics* (Amsterdam, 1978), in which he discusses the functional and methodological problems of the environment from an economic point of view. He rightly points out that the increase in the use of natural resources and materials causes an increase in

national welfare and at the same time increases the waste of production and consumption, that is, further degradation of the environment.

Studies by English author David W. Pearce et al. *Economics of Natural resources and the Environment* (London, 1990) and the American author Berry C. Field's *Environmental economics* (New York, 1994) also include the economic aspects of environmental protection and determine the subject and work methods of the new scientific discipline of environmental economics.

The books *New Direction* (Zagreb, 1995) by S. Schmidheiny and *Green Inc* (London, 1995) by F. Cairncross indicate a new environmental policy implemented in the economy of developed countries. Those books show with numerous examples and quotes that the environmental policy is being integrated step by step with the economic policy of states and companies and that a friendly relationship with the environment is developing.

Finally, it is necessary to mention the study by the author Ratko Zelenika, who in the book *Science of Science* (Rijeka, 2004) defined and clearly presented the basics of economic research and determined the methodology of scientific-research work, which to a considerable extent helped shape this work methodologically and in terms of content.

### **1.5 Scientific methods**

The following scientific research methods were used in the processing of the topics discussed in this paper in appropriate combinations: inductive and deductive, methods of abstraction and concretization, methods of generalization and specialization, methods of definition and classification, historical method, logical method, and as the most frequently used and most significant methods of analysis and synthesis in determining the appropriate necessary knowledge of environmental managers and applying it to their education and training programs.

## **2. Significance of Environmental Pollution and Sustainable Development**

The strategic threat of human civilization to the global environment has led to negative trends in all environmental indicators. Thus, the trends of forest loss and species extinction are accelerating, climate changes are occurring, and with them natural disasters, water is running out, and soil erosion is causing more and more damage.

Technical and technological growth, which is based on the strong development of science, constantly accelerates the growth of productivity, and contributes to the constant increase in production, and thus to the ever-increasing depletion of natural resources. Strong economic growth, especially in certain developed countries, has created global politics and growing differences between the rich and the poor. With its modern technological capacities, the economy has created the illusion of "unlimited power of economic growth and non-distinction between the terms growth and development" (Šebić, 2002). Pollution of the atmosphere and oceans on a global scale is taking on worrying dimensions, and the decline in food production and the growth of genetically modified food are causing hunger and concern. All this points to the imbalance that has arisen between human development and the environment. Civilization's great need for natural resources and weak environmental balance have led to an ecological crisis of global proportions.

But, the most dangerous threats to our global environment are not only the mentioned threats, but the way in which we experience this crisis. Scientists must continuously research environmental and development problems, but this must not diminish our action to "do something now"; the balance between development and the environment must be restored and greater personal responsibility must

be taken for the destruction of the global environment.

Free market economics, arguably the most powerful tool of civilization, ignores the value of environmental goods (clean air, water, healthy forests, etc.). It cannot see, and even less economists can measure the value of these goods, because there are no points of contact between macroeconomics and the environment. All this indicates that it is necessary to scientifically and professionally point out development and environmental problems with objective information. Therefore, it is very necessary to change the overall human awareness towards one's own natural environment, and especially towards ecological systems. It is necessary to reduce the entropy of the Earth's ecosystem and create a new philosophy of development that will be in the interest of man, but not for man to destroy the ecosystems without which he cannot survive. In other words, we have to move to sustainable development.

As already pointed out, development and economic policy in the search for a balance of economic activities exerts a strong pressure on the environment and creates an ecological imbalance on Earth. These pressures are primarily reflected through economic development activities, but also through uncontrolled demographic development in certain parts of our planet. All this points to the fact that through scientific research, public discussions and ecological and moral pressures, political structures on the international and national level will be forced to regulate the use of ecological goods and pressure on the increasingly "sensitive" environment.

### **2.1 Anthropogenic causes of environmental pollution**

Finally, today it is clear that the market cannot automatically (independently) regulate the imbalance of ecosystems, and future development and economic policy are aimed at cooperation with environmental protection policy, namely (Schick, 2015):

- Through appropriate legislation to protect natural resources (water, forests, arable land, sea) from exploitation that is driven primarily by profit and short-term economic interests.
- By conducting an industrial policy that should be planned for long-term development.
- Through state institutions that should encourage comprehensive research on resource and energy management, especially in energy-intensive branches, in order to gain comprehensive scientific insight into the state and perspectives of resource productivity growth. On the basis of such a study, it is possible to start planning the rate of growth of resource productivity until 2025, and create measures of encouragement and monitoring.
- Through the planned income, which should allocate more funds for education and science, considering that knowledge is the basic resource for the effective disposal of natural and human capital in the 21st century.
- They are in line with the precautionary principle, which is one of the foundations of managing a complex adaptive system like the economy.

In conclusion, it could be emphasized that the global environmental problems created by the global economy can be solved successfully only by the active role of the state, the international community and the global economy, and not only by the open market and its laws.

### **2.2 Rapid population growth and urbanization**

From the time of the appearance of man to 1945, it took more than ten thousand generations for the population to reach two billion. And now, in the span of one lifetime, the world's population has grown from two billion to more than 6 billion. While the world population at the beginning of the century numbered 1.6 billion people, today it has grown to 6.67 billion people, and it is predicted that

*MANAGEMENT OF SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL PROTECTION*

by 2050 there will be around 9.2 billion people living on Earth.

At the beginning of the new era, the population of our planet took 600 years to double, and at the beginning of the 19th century, the population doubled in 80 years, and today it doubles in 35 years; it only took 12 years for the population to increase by one billion, which is the shortest period so far (Črnjar, 1997).

What kind of pressure on the environment is caused by such an "explosion" of the population can be represented by the fact that at the beginning of the 20th century there was hardly any talk about environmental problems, and today we are talking about an ecological crisis of global proportion.

During much of human history, the world's population grew very slowly. Growth rates began to increase slightly during the 17th and 18th centuries as death rates decreased. The highest rates were recorded during the 20th century and reached a peak of 2% in the period from 1965 to 1970. From 1950 to 2007, the world population increased by about 2.6 times. In the period from 2005 to 2010, the growth rate at the world level will be 1.17% and is predicted to decrease to 0.36% by 2045-2050. year (table 1).

**Table 1.** Projections of the total population and population growth rates in the world, developed countries and developing countries (in the period from 1985 to 2050, medium variant)

Year	Total population (in millions)		
	World	Developed countries	Developing countries
1985	4855	1 115	3 740
1995.	5 719	1 175	4 544
2005.	6 515	1 216	5 299
2015.	7 295	1 245	6 050
2025.	8 011	1 259	6 752
2035.	8 587	1 260	7 327
2050.	9 191	1 245	7 946
Average annual population growth rate			
1985 – 1990	1,73	0,60	2,60
1990 – 1995	1,54	0,45	1,83
1995 – 2000	1,37	0,32	1,63
2000 – 2005	1,24	0,36	1,44
2005 – 2010	1,17	0,28	1,37
2010 – 2015	1,10	0,20	1,28
2015 – 2020	1,00	0,14	1,17
2020 – 2025	0,88	0,08	1,30
2025 – 2030	0,75	0,03	0,89
2030 – 2035	0,64	-0,01	0,75
2035 – 2040	0,54	-0,05	0,64
2040 – 2045	0,45	-0,08	0,54
2045 – 2050	0,36	-0,10	0,44

**Source:** World Population Prospects: The 2006 Revision, Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, <http://esa.un.org/unpp>

**Urbanization** is a process that developed rapidly after the Second World War in developed countries and in development countries. It is a fact that at the beginning of the 20th century there were 11 million cities on Earth, but in 1975 in 2005 there were 190, and today there are more than 200. In 2005, about 20 cities had more than 10 million inhabitants, with about 70% of them in developing countries.

Cities are a very sensitive ecological system and, as a rule, require imports of food, energy, water, etc. That is why the natural creation and expansion of cities is a very sensitive ecological, economic and social problem today, especially in poor and underdeveloped countries. Today in developed countries 70-80% of the population lives in urban areas. Regardless, estimates indicate that cities will continue to develop rapidly in the future, especially in developing countries, to frightening dimensions.

### **2.3 Industrial and technological revolution**

In the entire world, fossil fuels (oil, gas and coal) still make up the largest part of the fuel. Among them, coal consumption is predicted to grow the most, primarily due to the growth in demand from the energy sector in China and India. Such trends lead to a constant increase in global carbon dioxide emissions - up to 57%. China is the world's largest emitter of carbon dioxide, while India became the third polluter by 2015. By 2030, China will almost catch up with Europe in terms of emissions per capita.

Because of all this, the global energy policy should be an integral part of the overall economic policy and environmental protection policy. Directing energy development to alternative energy sources (sun, wind, sea) can contribute to reducing environmental degradation in the future.

When talking about renewable energy sources, the World Energy Organization (IEA) distinguishes between: hydropower, fuel from renewable materials, waste (including biomass and used energy from waste), and others, including geothermal energy, solar energy, wind energy, and wave/tidal energy (OECD, 2007). High technologies can cause a revolution in terms of reducing environmental pollution, but in addition to all other activities that society needs to undertake. It is important to create conditions that will enable the transfer and application of technology. The development of new technologies and the speed of their spread among industrial and developing countries is the most important means for the structural changes that are expected in industry and in environmental protection (Pokrajac et al., 2015). Through the process of innovation of new technology, new products and production processes are created that enable the increase of people's well-being, creating environmentally friendly products and production processes.

### **2.4 Accelerated development of traffic and traffic infrastructure**

Traffic is a part of human activities and significantly affects its quality, enriches and enriches human life, but at the same time causes many bad environmental consequences. However, the impact of traffic affects the environment by constantly increasing the emission of harmful substances into the air due to the constant increase in the number of vehicles and the consumption of motor fuels, as well as accidents during transportation. Harmful environmental consequences of traffic have different characteristics and modes of action. Modern society wants to keep the harmful consequences of traffic under control and reduce them with regulatory measures. The main impact of traffic on the environment is related to the emission of greenhouse gases, local air pollution, noise and traffic congestion. Traffic activity also creates significant external costs associated with traffic accidents, and depletion of non-renewable energy sources (especially fossil fuels).



### **2.5 Large quantities of all types of waste**

It is important to point out that the attitude of modern man towards the global environment is in a major crisis, as evidenced by the large quantities of waste that are removed from cities and businesses. Large amounts of waste very often end up in nature or in the oceans. Today, man has started to drown in that "river" by relying for too long on the old strategy of "out of sight, out of mind". There are several problems associated with procrastination. In addition to taking up more and more valuable land, it also causes air, water and soil pollution, releasing carbon dioxide and methane into the atmosphere, and chemicals and pesticides into the soil and groundwater, which poses a danger to human health, plants and animals. New sanitary landfills are constructed in such a way that they have an impermeable bottom and sides, that seepage water and gases are monitored and drained, and that the quantity and composition of the material that is disposed of is continuously monitored.

Another form of waste disposal is thermal treatment, which is an effective but relatively expensive way of processing municipal waste. Another option for waste management is recycling, as far as that is concerned, the European Union has set conditions for constantly increasing the amount of waste that is recycled.

### **2.6 The development of mass tourism**

Tourism, by its meaning, is "a completely new spatial-socio-economic phenomenon of the 20th century" and is a major user of space, and especially depends on the quality of space and environment. In its development so far, tourism has experienced numerous external and internal changes, starting with different forms and means used, to the change in scope and spatial dimension in which it developed, and to the different functions it had in certain social arrangements. As long as tourism was relatively small in number and disproportionately distributed over space, and was understood as "passive tourist leisure", the impact of such tourism on the environment was not a particular problem. When tourism took on massive proportions, when masses of people began to move mainly to spatially concentrated tourist destinations, and when there was a sudden change in the way tourists behave - when tourism turns from passive to active and tourists begin to "consume" nature and natural resources - tourism acquires negative characteristics.

"Tourism has become one of the most relevant spatial-geographic phenomena and, along with industrialization and urbanization, it is one of the strongest factors of pressure on space and the most fatal causes of nature degradation precisely in these areas where nature is the most beautiful, the most attractive, and the most valuable from a tourist point of view, but also the most sensitive.

Despite the fact that tourism, in addition to all the positive economic, social, cultural and ecological advantages it brings, threatens the quality of the environment, perhaps more than any other sector. The greatest pressures of tourism on the environment are mainly the result of the concentration of tourist activity in a relatively limited space and time. A particularly big problem in tourism is the increase in housing density during the summer, so for example the housing density in Monaco increases by 765%, 383% in Malta, 207% in France, 157% in Italy (Trumbić et al., 2005). In addition to the inevitable pressure on the space, certain tourist activities significantly endanger the environment, e.g. excessive visits to sensitive areas, hiking, driving cars in the countryside, building golf courses and the like. In order to be able to develop successfully, tourism requires a quality and clean environment, and its development threatens the quality of that environment every day. The solution to that problem should be sought in the so-called "sustainable tourism development" which will establish a positive relationship between tourism development and environmental protection.

### **2.7 Natural causes of environmental pollution**

Although natural causes of environmental pollution are part of the evolution of our planet, they often turn into natural disasters due to human influence. Natural phenomena threaten and disrupt relationships in the environment. Natural disasters have always been a great danger for people and their material goods. While in the past natural disasters were caused solely by evolution, today these natural disasters are also influenced by human activity. Natural disasters take many human lives and cause great material damage. In the following text, we will mention some natural phenomena that occur as natural disasters, but we will not discuss these phenomena in detail (Ahmet, 2017):

1. **Soil erosion** is a natural process as old as the Earth itself. It is a process caused by various natural conditions, but also by human activity. As with some other natural processes, man accelerated that process with his activity. Soil erosion has become a worldwide problem because it affects large areas and causes irreparable damage.
2. **Floods** they are most often caused by heavy and long-lasting rains and sudden melting of snow. Unlike erosion, floods do not occur suddenly and can usually be predicted.
3. **An earthquake** usually occurs suddenly and causes numerous human casualties and destruction in urban areas. There are about 100,000 earthquakes a year on Earth. There are two seismic areas subject to more frequent earthquakes: one is the so-called European-Trans-Asian, and the other is Pacific.
4. **Volcanic eruptions** recorded during the previous period are often repeated with their own characteristics.
5. **Fires** they occur as a consequence of natural phenomena and often develop into natural disasters.
6. **Droughts and winds** they are natural causes of environmental problems. They are the result of climate change that occurs due to the evolution of the Earth, but also due to human activity and environmental pollution.

### **2.8 Other causes of environmental pollution**

It is a fact that people live better and worse at the same time. The environment is becoming more and more polluted every day, more dangerous for people's health and life, and plant and animal species are increasingly being destroyed and disappearing. Developed countries exploit almost the entire wealth of the Earth, while poor countries continue to live in poverty and in a polluted environment.

The ecological crisis, considering the disruption of the balance between human society and the natural environment with a catastrophic perspective, can in a certain way be considered the deepest crisis in the history of the preservation of the human species. Therefore, environmental problems, and especially the crisis, open up the deepest questions of human survival. The question is often asked why a crisis of such proportions occurs in the first place, and whether there are opportunities to overcome the crisis through conscious intervention, that is, by applying a strategy to solve it (Ahmet, 2017).

As is known, the crisis itself is an expression of modern commodity production and its competitive nature in which capital engages scientific, technical and technological power. The struggle for efficiency, and thus quantitative growth, takes on a degree of depletion, pollution and destruction of the environment that threatens human survival on Earth. In addition, there is an increase in the birth rate worldwide, which, with its exponential tendency, also calls into question survival itself.

All of the above indicates that the disturbed balance between progress and nature must be achieved by building a new "macro-ethics" whose basic principle would be responsibility for the survival of humanity and the ecological systems it desperately needs, i.e. nature.

### **3. Limited scientific, technical and technological possibilities of society**

Problems of underdeveloped countries, i.e. developing countries, or as it is commonly called "third world countries", are getting bigger. More than one and a half billion of the world's population lives in conditions of extreme poverty. Often with an income below one US dollar. It can be said that about one third of humanity lives in conditions of misery and on the border between good and evil.

Because of the above, as well as because of the structural crisis affecting the world economy, it is difficult to imagine that something more could be done individually to save the environment.

The global economic crisis caused by the growth of energy, food, inflation, unemployment, indebtedness, increasing exploitation of natural resources and increasing pollution of the global environment calls for cooperation and association, calls for social sensitivity and greater aid to poor countries. Only in this way can global environmental problems begin to be solved.

The eternal question arises "what are the material possibilities of society to solve global environmental problems, especially in the era of global economic crisis?" Regardless of the above, a special plan is needed right now that combines comprehensive, long-term and targeted financial assistance to developing countries in order to transfer new technologies necessary for the permanent economic progress of those countries (Milović, 2013). Those countries need help in stabilizing the population and its education, and at the same time industrially developed countries must speed up the transition to ecologically sustainable development. The Global Environmental Facility (GEF) at the UN can be one of the mechanisms for achieving common goals, especially for helping underdeveloped countries.

And just as importantly, developed nations must be prepared to lead by example; otherwise the third world will not want to accept the necessary changes – even in exchange for substantial aid”.

Today, in many cities and countries, there are not enough material possibilities to solve environmental problems. How to secure food so that the population can survive is still a priority problem, and solving environmental problems is on the second plan. The material capabilities of society significantly influence the solution of environmental problems, so it can often be said: it is richer and safer for the environment (Ilić-Krstić, 2016).

"In the last twenty years, the relationship between man and the environment has fundamentally changed, although even today most people are not aware of this new relationship. This is partly because the relationship is global, and many people are not used to such a way of looking at things. As urgent environmental problems require immediate action, more and more people and experts have begun to think in terms of long-term and global actions. In doing so, one tries to predict the future of our planet, different scenarios are worked out, the current situation is analyzed and one wants to predict the state of environmental problems in the future.

#### **3.1 Global climate change and its consequences**

The role of climate in shaping human history is very complex, and historians often attribute to it a decisive role in the development of human history. History proves that climate changes are most often caused by evolutionary changes on Earth or major natural disasters (volcanic eruptions, etc.), and in the last ten years by human activity.

We thank the so-called Life on Earth. "natural greenhouse effect". Without it, instead of the average 15°C, the arctic cold of -18°C would prevail on the Earth's surface, i.e. 33°C lower temperatures (Todic, 2016).

In 2000, the total global annual emission of CO<sub>2</sub> was about 7 billion tons, and already in 2050 it is predicted that it will reach about 20 billion tons, which will depend on the state of economic growth and environmental legislation.

The consequences of global climate change will cause terrifying climate disasters during the next century, some of which are already underway. The strength of the impact strongly depends on the rise in temperature, which is one of the strongest indicators of global climate change. Consequences of climate change include increased risk of floods and droughts, melting glaciers, rising sea levels, loss of biodiversity, threats to human health and damage to economic sectors such as forestry, agriculture, tourism, industry, insurance, etc.

### **3.2 The disappearance of the ozone layer and its consequences**

The ozone problem is partly confusing. Namely, ozone appears at two levels in the atmosphere: in the stratosphere and the troposphere. It is a gas that occurs naturally, and in the stratosphere it collects as the ozone layer and is similar to a thin belt around the Earth. There, the concentration of ozone is positive because it protects the Earth from the sun's ultraviolet radiation, so it absorbs about 77% of the radiation. At the same time, ozone that is deposited at a lower atmospheric level, in the troposphere, can have a harmful effect on health, vegetation, etc., and is also involved in the general process of acid rain formation. Although the creation of tropospheric ozone is natural, it can also be enhanced by the interaction of various other gases and compounds.

Ozone (O<sub>3</sub>) is a blue-white gas composed of three oxygen atoms in a molecule. It is created naturally in the upper layers of the atmosphere - in the stratosphere, with the help of ultraviolet radiation from the Sun. At the beginning of the 70s, scientists determined that chlorofluorocarbons (CFCs), popularly called "freons", are the main cause of ozone formation. Scientists have made a dramatic discovery in Antarctica. They estimated that in the period from September to October 1986, the ozone layer over Antarctica decreased by 50% compared to the 1960s. This resulted in the creation of a large "hole", the size of which is roughly equal to the land area of the United States. The hole appears to recover on its own after a period of time has passed since parts of the ozone layer have disappeared, but later reappears.

The disappearance of the ozone layer leads to increased solar radiation, which is why skin cancer is more common. These diseases are on the rise in the world, but it is uncertain how much this increase is affected by the reduction of the ozone layer. Based on experience, the rule of thumb is that a 1% reduction in the ozone layer causes an increase in ultraviolet radiation by 1 to 2%, and the incidence of skin cancer by 3 to 4%. Other health effects have not been proven.

In 1996, all industrialized countries were supposed to stop the production and use of CFCs, and should switch to their substitutes.

### **3.3 Ecological "boomerang" of irresponsible human behavior towards nature**

For responsible human behavior towards the planet Earth, it is very important that the organizational behavior of society, i.e. togetherness, because the solution to environmental problems and the boomerang effect is possible only in the cooperation of different subjects, not in domination and exploitation. The lack of joint responsibility for the future development and ecological problems of the Earth can lead us to an economic-ecological disaster.

#### **4. Sustainable Development: the Challenge of Civilization**

Therefore, the root of the crisis lies in the goals of human activity (socio-economic development) and the way man converts natural capital (natural values) into his private capital.

The World Conference on Environment and Development held under the auspices of the UN (Rio de Janeiro, 1992) definitely accepted the concept of sustainable development as the only known solution to the problems of development and environmental protection.

Therefore, the concept of sustainable development is based on economic and ecological starting points and principles, whereby some authors emphasize the principle of sustainable development, while others emphasize the principle of ecological sustainability. In other words, some authors approach sustainable development from an anthropocentric point of view, while others observe it from an ecocentric point of view (Saks, 2014).

Unlike other types of management, management of sustainable development assumes different knowledge and skills acquired by studying social sciences (especially economics, environmental economics and strategic management) and different areas of natural sciences (ecology, biology, technology, systems theory, etc.).

Sustainable development should be understood as the result of individual action of consumers, entrepreneurs, conservationists and states that strive to achieve individual goals with the intention of jointly considering and waiting for a better future.

The term sustainable development cannot, therefore, be defined only as an economic activity that satisfies present and future generations, but sustainability should be understood as the infinite survival of the quality of systems that ensure life (air, water, soil, flora, fauna) as well as the existence of infrastructure and institutions that distribute and protect ecological systems with appropriate regulations (Prica, 2014).

#### **5. Knowledge management in the function of sustainable development**

The role played by faculty studies in global sustainable growth and development is based on the fact that almost every faculty studies current environmental problems and problems of sustainable growth and development. Namely, such issues are studied in special compulsory or optional programs, or in special thematic units of the respective programs.

Doctors of multidisciplinary sustainable development sciences (that's a colloquial phrase) should be creators, faculty professors, scientists, top managers, ministers, bearers, competent experts of all initiatives, all activities, all measures, all rules, all declarations, all directives, all programs, of all projects with the theme of the environment, ecology, sustainable growth and development in the broadest sense of those terms.

Although knowledge has been a fundamental source of long-term economic growth since the Industrial Revolution, what differentiates its meaning today as a generator of growth is that information and communication technology has exponentially accelerated the shift to a knowledge economy, enabling information codified in digital form to be transmitted over long distances with low costs (Gašić, 2013).

A society that has educated people can more easily accept and react more quickly to the changes occurring in its environment, and it is also prepared for the challenges that the future will bring. In contrast, in a society where human potential and knowledge are not given meaning, there is a danger of lagging behind modern development. Such a danger also threatens Montenegro, which is at a critical moment of choosing a strategy for future development.

### **5.1 Sustainable Development Management**

There seem to be reasons in principle for not having enough information or foresight to design institutions that could successfully solve very complex problems. Despite everything, a lot can be done to make the level of sustainability of this civilization higher than it is today. Just because one does not know how to create a truly sustainable society, does not mean that measures cannot be taken to make them less unsustainable (Adžemović, 2016).

The inevitable process of transition to sustainable forms of development determines the direction of human development and shapes our way of life, and thus the way of doing business. And yet, until now, a large number of business people have passively watched the solution (Dresner, 2008). Development must be directed towards production that satisfies human needs with minimal consumption of energy and other resources in the entire life cycle of the product per unit of satisfying human needs. The parameter of each product must be its eco-efficiency, that it has value and creates benefit, in relation to the costs and burdens on the environment.

There is no unique way of defining sustainable consumption, but in most documents that discuss it, it is defined as the use of services and products that correspond to basic needs and contribute to a better quality of life, while minimizing the use of natural resources and toxic substances, as well as the emission of waste and pollution during the life cycle of products or services, so as not to jeopardize meeting the needs of future generations.

If the definition of sustainable development is accepted, which includes economic, ecological, social and technological sustainability, as well as the possibility of the situation of certain types of capital (manufactured, natural, human, social), which will provide future generations with at least such an opportunity or capacity to achieve well-being as previous generations had, ideas of sustainable development becomes applicable and can be introduced into the basis of the entire economic policy. The implementation of such an economic policy, which will aim to guide development in accordance with the principles of sustainability, has the following assumptions (Krstić et al., 2017):

- political will for sustainable development at the highest levels of state administration,
- appropriate structure of state administration and local self-government, good communication and exchange of information between different levels of management and between different bodies at individual levels,
- development decision-making in which economic goals are determined in parallel and connected with social goals of environmental protection and improvement,
- education for understanding the links between economic policy and the environment and decision-making in accordance with the principles of sustainability.

In recent years, Montenegro has begun to fulfill some of the conditions that bring it closer to the proposal of sustainable development: legislation is being developed, a critical mass of knowledge has been reached, and the behavior of entrepreneurs is also changing. The political will for sustainable development is still questionable. Therefore, they need to strengthen institutions, better enforce laws and interdisciplinary problem solving. Instead of a comprehensive solution to the problem, the approach to individual elements of the environment (air, water, soil) still prevails in Montenegro, which is also visible in the existing legislation.

In every sector of the economy, there are ways to approach the path of sustainable development. However, when determining the policy that will follow such a path, it is necessary to avoid a sectoral approach and determine the priority directions of development at the level of the entire economy. That's why an interdisciplinary way of solving problems should be applied here as

## *MANAGEMENT OF SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL PROTECTION*

well and the way of decision-making should be changed so that the goals of protecting and improving the environment are equal to other goals of the development policy and that all interested groups and parties are included in their adoption.

One of the main goals of Montenegro, development policy and accession to the European Union. This, among other things, also means that the legislation and environmental protection standards should be harmonized with the legislation. The framework and guidelines for harmonization represent the so-called overview of the current state of the environment. One of the conditions for starting accession negotiations, which is set for the candidate countries, is the adoption of a National Strategy for the Adoption and Implementation of the Current State of the Environment. In partnership with the EU, the Strategy should be implemented in all candidate countries before accession. That document establishes the priorities and goals that must be met before accession and the time plan for further activities until full alignment.

"In the European context, Montenegro has a relatively well-preserved environment, however, the degree of its protection is still lower here than the average of European developed countries. Environmental protection is largely the result of the lower presence of "heavy" industries in the overall industrial structure, but investments in environmental protection are lower than in developed European countries. Responsible behavior, however, requires constant care for all subjects of the environment - soil, air, water, sea and biological diversity.

It should be emphasized that the entire system of upbringing and education should be adapted to the concept of sustainable development of Montenegro. A process of constant learning and research should be opened. Therefore, there must be a new ("revolutionary") view of the world that would like to unite economic, social and ecological needs, capital, labor, natural resources into one harmonious whole, convincing, realistic and thought out in every detail.

### **CONCLUSIONS**

Although Montenegro has a long tradition of internationally recognized scientific excellence, the commercial application of scientific results and the economic benefits resulting from them have been very small so far. In Montenegro today there is no appropriate infrastructure for technology transfer, but without it, it will not be possible to achieve the desired transfer of knowledge from the academic sphere to the economy. The role of the state and the public sector in encouraging the transfer of knowledge and technology is necessary and justified because innovation, the spread of knowledge and technology create significant positive social effects. State investments are needed to create conditions for research work and higher education, as these are areas where advances in funding can yield significant positive results.

Only on the basis of a broad base of scientific and educational institutions and demonstrated political will, as well as connecting different interest groups, can it be designed and implemented in quality in the future sustainable development strategies of Montenegro. Achieving growth, development, social inclusion and fairness are elements of prosperity that require simultaneous and coordinated action in a number of strategic areas. Drivers of the development moment whose lack or incompleteness at this moment directly inhibits faster development are: non-existent entrepreneurial climate, unfinished processes of privatization and restructuring, and unfinished transformation of the state into a service for citizens and entrepreneurs. Furthermore, the synergy of progress and prosperity requires permanent binding elements: macroeconomic stability, openness, an effective financial market and sustainable development.

In conclusion, it can be pointed out that, unfortunately, Montenegro is surviving a serious economic-ecological crisis, partly imposed as a global crisis, and partly as a consequence of the fact that for many years no reforms were implemented and no investment was made for planned economic-ecological development. It is clear that the small and relatively underdeveloped Montenegrin economy and society is still far from scientific and detailed design of its future development. But, if the future is not designed, it will spontaneously move in an unknown direction. That is why it is necessary to convincingly and realistically, bearing in mind the Montenegrin reality of development, human needs, but also the Montenegrin reality of natural capital, devise and affirm the concept of sustainable development based on the principles of integral sustainability in Montenegro. Montenegro won its freedom and now it has to win a development path that will enable it to rank with the most economically and ecologically advanced countries. Unfortunately, there is no time to wait, what is required is quick and well thought out action by all structures of Montenegrin society. This is the only way to leave a developed and ecologically protected Montenegro to yourself and future generations.

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