

# The Relationship Between Environmental Issues and Economic Development: Transition to Sustainable Development of Economic Systems

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**Abstract:** The study highlights the main environmental challenges of economic development of the world economy in the context of modern globalization processes. The problem of ensuring the sustainable development of economic systems is becoming more and more ambitious, and humanity's concern about the anthropogenic impact on the ecological safety of the Earth and all living organisms is growing. The main areas of sustainable development of economic systems are considered, and the main problems of humanity in terms of natural and human capital are outlined. A comparative analysis of the quality of life in different countries of the world, depending on the state of the environment, is carried out. The economic losses of EU countries from extreme climate events are estimated. The relationship between the economic footprint and GDP in different countries of the world is revealed. Instead, the global economy faces the risk of a prolonged period of low growth, all due to the effects of the COVID-19 pandemic, the impact of climate change, macroeconomic structural challenges, Russia's military aggression against Ukraine, and political instability. It is established that the global economic outlook is a direct challenge to achieving the Sustainable Development Goals. The global community must urgently address the growing financing gap faced by many developing countries, changing their capacity to make important investments in sustainable development and helping them transform their economies to achieve inclusive and sustainable long-term growth. The basic approaches to the formation of sustainable economic development of the world economy are outlined, taking into account modern realities.

**Keywords:** Environmental problems, Sustainable development, Ecological footprint, Gross domestic product, World economy.

## 1. INTRODUCTION

The past few decades have seen rapid economic growth and industrialization. As a result, various socio-economic and environmental issues have arisen around the world. Countries are striving to preserve the natural environment, and scientists are trying to explore new dimensions of environmental sustainability.

At the present stage, environmental issues are particularly acute, leading to negative trends in the socio-economic development of countries around the world. This is manifested primarily in the deterioration of the public health of nations, reduced life expectancy at birth, and significant social stratification of societies due to unequal access to resources.

It results in a violation of the "nature-economy-society" balance, *i.e.*, the global concept of sustainable development (Rees, 2003). One of the main reasons for this is the disturbance of ecosystems' balance and the emergence of threats to environmental safety. In this regard, there is an obvious need to investigate the relationship between environmental security and sustainable economic development, to identify causes and consequences, and to determine the nature of their mutual influence.

## 2. LITERATURE REVIEW

The global scientific community is increasingly paying attention to the catastrophic consequences of human intervention in the natural environment. The issues of economic development and environmental problems in the context of globalization are the subject of research in scientific works (Clemençon, 2006; Symonenko, 2008; Barbier, 2011; Markard, Raven, Truffer, 2012; Malys, 2014; Oriekhova,

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**Fig. (1).** The main areas of sustainable development of economic systems.  
Source: compiled by the author.

Ishchuk, 2017; Pimonenko, 2017; Marianovych, 2019). A significant place is occupied by research on carbon dioxide emissions and their impact on the environment (Ellerman, Joskow, 2011; Cigar, 2013; Uddin, 2017; Gozgor, 2017; Farooq, 2019; Mardani, 2019; Hashmi, 2019). Many analytical studies have been conducted on the relationship between economic and environmental indicators of the world economy (Iqbal, 2019; Payne, 2021; Ahmed, 2021; Wilkinson, 2022; Kazemzadeh, 2023). Scientists from all over the world are trying to assess the damage caused by the imbalance in nature, determine the scope and directions of innovations in environmental protection, and preserve biodiversity through regulatory mechanisms (Dixit, 1996; Boettke, 2008; Dasgupta, 2008; Convery, 2009; Grainger, 2009; Angelsen, 2010; Barbier, 2011; Ahmad, 2023). Currently, the search for alternative renewable energy sources is becoming increasingly important (Gozgor, 2028; Jorgenson, 2022; Beretta, 2023; Wang, 2023). However, the pace of scientific progress is causing increasing harm to wildlife, including humanity. It requires a detailed study and development of an effective green policy both in the context of specific countries and the world in general.

### 3. AIMS

The study aims to explore the relationship between environmental issues and economic development. It is necessary to assess the ecological footprints on the development of the economy of particular world countries. In addition, the paper aims to outline the peculiarities of modern economic growth in the face of current challenges and threats. It is also crucial to identify the main directions of transition to sustainable development of economic systems.

### 4. METHODS

- The theoretical and methodological basis of the study was the fundamental principles of economic theory and publications of scientists on sustainable economic development in the context of aggravating environmental problems. The research used the following general scientific and special methods:
- systematic approach – to outline the main areas of sustainable development;
- historical and logical – to study the evolution of economic losses of the EU countries caused by

weather and climate extremes and the total cost of environmental protection in Ukraine;

- economic and mathematical – to assess the relationship between the ecological footprint and GDP per capita;
- abstract and logical – to formulate conclusions about the sustainable development of economic systems in the context of aggravating environmental problems.

### 5. RESULTS

Nature performs three main functions for humanity, namely:

- it provides natural resources (raw materials, consumer goods, oil, food) and public goods (habitat, air, ozone layer, natural beauty, biodiversity);
- it acts as a reservoir for waste (emissions).
- Sustainable economic growth means maintaining growth without creating economic problems or complications. It is the practice of preserving long-term economic growth without depleting resources (Lawson, 2019).

The World Bank Institute's analysis of the interdependence between economic growth and environmental quality (WBG, 2023) shows that neither fast nor slow growth is a factor that contributes to the preservation or degradation of natural capital. The key to a successful environmental policy includes:

- considering the quantitative and qualitative aspects of economic growth in their entirety, accompanied by a systematic assessment of mutual impacts;
- equal attention to all available assets, including natural and human capital (Musina, 2012).
- There is an ongoing debate about whether sustainable development policies create jobs, reduce poverty, or bankrupt businesses when they implement environmental policies (Wilkinson, 2022). Environmental issues can be divided into two categories:
- the protection, which includes the protection of land and water resources;
- the regulation, which includes the prohibition of deforestation and the regulation of toxic and hazardous waste disposal (Angelsen, 2010).

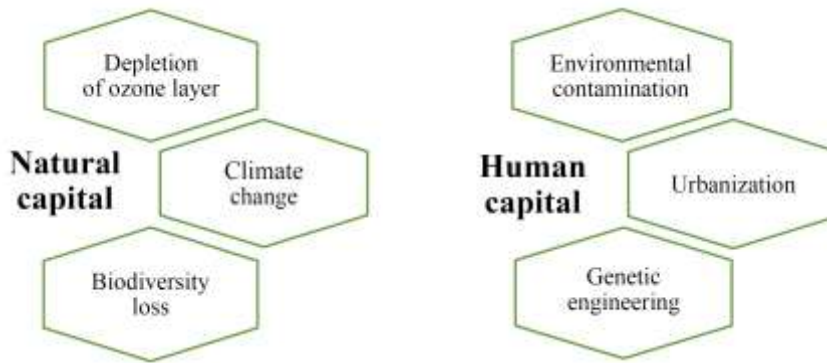


Fig. (2). The main environmental problems of humanity.

Source: compiled by the author.

Table 1. A comparative assessment of life quality in different world countries, 2022.

Indicators	Germany	USA	Poland	Ukraine	Mexico	India	Egypt	Iraq
GDP per capita, \$	52931	63069	34363	12944	18545	6675	12121	9475
Social Progress Index (SPI), %	88,72	84,65	80,17	74,17	70,74	60,19	58,73	56,82
Health and well-being, %	83,07	65,57	67,12	50,99	57,79	51,39	40,89	55,14
Environment quality, %	78,44	75,50	68,12	64,46	58,71	27,86	20,35	31,65
Nutrition and basic health care, %	93,66	93,22	93,88	80,47	88,52	72,22	90,84	80,48
Water supply and sanitation, %	95,93	94,28	93,89	82,65	89,36	80,47	86,25	74,09

Source: The Social Progress Imperative (2022).

Note: base percentage value =100.

- There are three main areas of sustainable development (Fig. 1).

Sustainable economic development is a national initiative based on the unique assets of local economies to address their particular challenges and ensure quantifiable, tangible advantages. It is a practical toolkit that adapts strategies for communities, companies, and institutions (SDG, 2016).

The environment is constantly changing, including as a result of human activity. Even small changes in the ecosystem can cause major disasters and tragedies now and in the future. People must understand what they are dealing with to respond effectively to hazards. Human activity is based on two types of capital: natural and human. As a result, it is possible to identify the main consequences of anthropogenic human impact on the environment (Fig. 2).

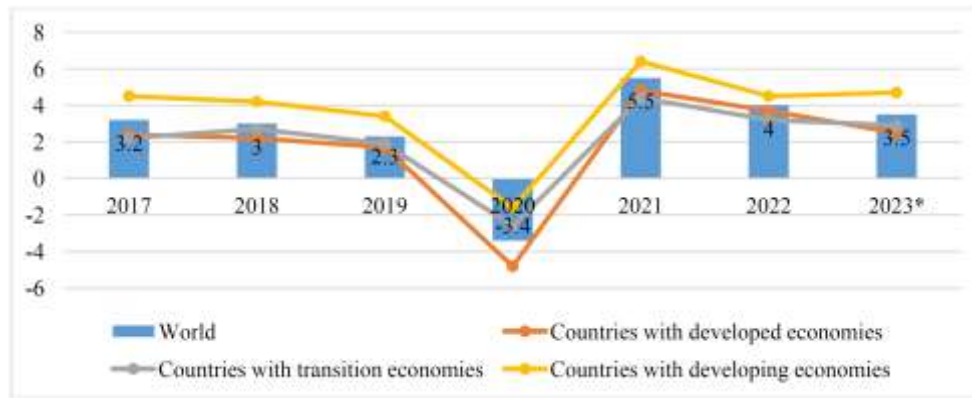
Sustainable development encompasses five main elements: food, energy, water, waste, and ecology (SDG, 2016). Many countries and organizations are taking steps to create a prosperous society that functions through sustainability. A benchmarking analysis of the main indicators of sustainable economic development according to the Social Progress Index (SPI) showed a pattern of dependence on the main criteria of environmental conditions and the quality of life (Table 1).

Many world economies are struggling to increase their GDP and eliminate all poverty. The survival of impoverished societies depends on natural resources, and they are the most

vulnerable to environmental degradation. According to National Geographic, the Great Pacific Garbage Patch covers the ocean from the West Coast of North America to Japan (NG, 2023). It consists mainly of non-biodegradable plastic. About 80% of this plastic comes from land-based sources, and the rest from boats and other marine sources. This garbage harms the marine ecocycle, directly affecting the fishing industry and, as a result, can cause severe economic problems in many parts of the world.

As the population grows, mass production and manufacturing rates increase to meet demand, but the Earth's resources are limited. The conservation of land and water resources can help reduce the cost of water treatment and improve air quality, which has a positive impact on human health. The prospects for a sustained global economic recovery remain unclear amid persistent inflation, rising interest rates, and growing uncertainty. Instead, the global economy faces the risk of a prolonged period of low growth. These risks are related to the effects of the COVID-19 pandemic, the ever-worsening impact of climate change, macroeconomic structural challenges, Russia's military aggression against Ukraine, and political instability. According to the World Economic Situation and Prospects 2023 (UNDP, 2023), the global economy is expected to grow by 2.3% in 2023 and by 2.4% in 2024 (Fig. 3).

In developing countries, the percentage of annual change in GDP is 4.7% (higher), while in developed countries, it is 2.5% (lower). For this reason, the global economic outlook is



**Fig. (3).** The change in world production and gross domestic product, 2017-2023, % per year.

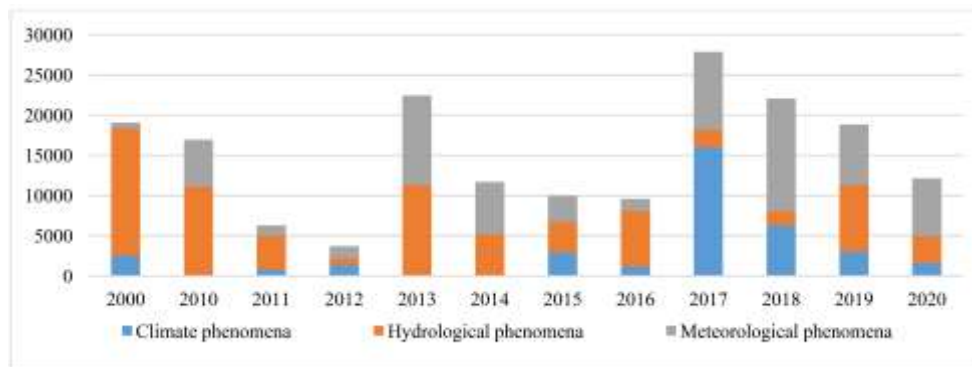
Source: UNDP (2023).

Note: \*2023 – forecast data.



**Fig. (4).** The EU countries' economic losses due to the climate change.

Source: Eurostat (2023).



**Fig. (5).** Annual economic damage caused by weather and climate phenomena in EU member states, € million.

Source: Dixit (1996).

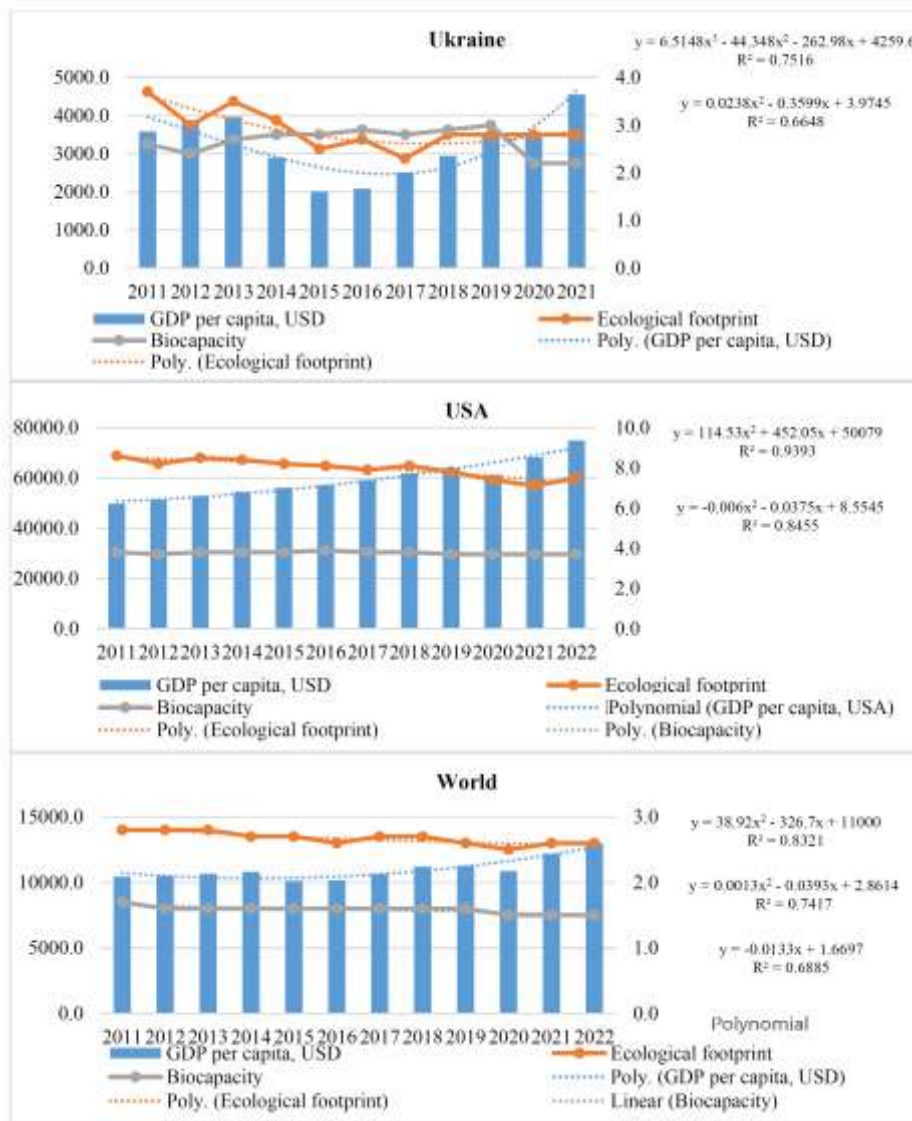
Note: weather phenomena (storms), hydrological phenomena (floods, mass displacements), and climate phenomena (heat waves, cold waves, droughts, forest fires).

a direct challenge to achieving the Sustainable Development Goals. The global community must urgently address the growing financing gap faced by many developing countries. They need to change their capacity to make critical investments in sustainable development and help them transform their economies to achieve inclusive and sustainable long-term growth.

Sustainable growth means providing more productive and profitable opportunities for future generations. A strong economy means that people have a higher available income to buy more food, build a bigger house, go on vacation, or

improve their living standards in other ways. This fosters the development of many industries, including manufacturing, housing, travel, and tourism. The conservation or replenishment of resources can allow a country to reduce imports and increase exports. All these factors contribute to the country's GDP.

From 2010 to 2021, extreme weather and climate-related phenomena caused economic losses in EU member states estimated at €286.8 billion, including €56.5 billion in 2021 (Fig. 4).



**Fig. (6).** The relationship between ecological footprint and GDP, 2011-2022. Source: GFN (2023).

It is difficult to analyze trends in economic losses from environmental changes. In part, they are caused by the high variability of natural phenomena and the lack of complete recording of hazardous emissions. However, the data show that economic losses are increasing over time. Since the weather and climate phenomena are expected to intensify, it is unlikely that the related economic losses will decrease by 2030. In addition, out of the 2.01 billion tons of municipal solid waste (annually), about 33% was not managed in an environmentally sound manner (WBG, 2023).

Twenty-five developing countries (the most significant number since 2000) spent more than 20% of their state revenues in 2022 on servicing their total foreign debt. The average low-income country spends about 2.3 times more on interest payments than on social assistance. Due to the economic turmoil, 165 million people are expected to fall below the poverty line between 2020 and 2023, given the poverty line of \$3.65 for low- and lower-middle-income countries. A debt repayment pause would allow debt-burdened developing economies to mitigate some of the social impacts of these

shocks by using resources earmarked for debt service (UNDP, 2023).

Thus, there are two interrelated problems:

- the first is to consider the impact of the growing scarcity of natural resources and environmental pollution on the development of social production and the living conditions of the population;
- the second is to intensify the development of new approaches to the social development policy aimed at minimizing these threats (Musina, 2012).
- Nevertheless, overcoming this problem requires more than just improving the efficiency of natural capital use. Given the ineffectiveness of circumventing population growth, returning to a more sustainable state requires progress in understanding the phenomenon of ecological footprint.

The ecological footprint measures the level of natural resource consumption and waste generated by human activity.



It is the most critical indicator of humanity's impact on ecosystems and the biosphere (Fig. 6).

The reduction of the ecological footprint is one of the most relevant challenges for humanity in the fight against the deterioration of life quality due to ecosystem destruction and climate change. Unfortunately, the safe limits of natural capital use have been exceeded, and all feasible contributions are needed to curb this trend. According to data from the Global Footprint Network (2023), the ecological footprint was equal to the Earth's biocapacity in 1970. However, by 2018, this number had increased to 1.75. It is dangerously higher than what is compatible with sustainable economic development in the future. For example, in 2022, the Earth's Transit Day, i.e., when humanity exhausted its natural budget for the year, was on Jul 28 (Global Footprint Network, 2023).

The reduction of the ecological footprint is essential to ensure a sustainable future for humanity and to preserve the well-being of the planet for future generations. Thus, the main challenge faced by scientists, entrepreneurs, and politicians is related to the sustainability of economic policies and how to achieve sustainable development under the influencing factors (Hashmi, 2019\$ EAA, 2023). The factors involved in a comprehensive explanation of ecological footprint change are complex. They demand an approach capable of defining necessary conditions and delving into asymmetry and diverse combinations that explain condition combinations, addressing low or high ecological footprints. In other words, countries have different ways of maintaining their biocapacity.

## 6. DISCUSSION

The concept of sustainable economic activity, development, and resource utilization must serve as a fundamental criterion for future policy. Its implementation necessitates a radical change in perspective within the existing economic system, the emergence of new development models for both developing and developed countries, and the activation of research efforts toward the implementation of sustainable development and the adoption of consistent policies. The political process should establish dimensions and standards for economic processes.

Despite the interrelatedness of environmental and development issues, they have no exclusive connection. However, it should be noted that improving food security, personal security, health, national debt, human rights, and illiteracy (all of which are not directly related to environmental protection) will indirectly contribute to ecological security.

The current emergence of environmental issues as externalities is a critical weakness of economic systems (market or transition economies) as it discourages environmentally sound behavior and activities. Corresponding measures, mechanisms, and incentives such as levies, property rights, and extended responsibility must be designed and integrated into pricing systems. No society can afford incorrect relative pricing as it would threaten stability (Guerrero, 2022).

Effective recycling programs reduce soil and water pollution and subsequently lower purification costs. Reduction of carbon emissions improves air quality. A healthier population

can contribute to a more productive workforce, reduced healthcare expenses, and improved quality of life.

However, aspects of nature, such as biodiversity, cannot be quantitatively expressed or evaluated within an economic system. In such cases, decisions regarding prices and values should be made collectively rather than through market mechanisms.

In market economies, the economic rationale has historically focused on economic operations without accounting for physical aspects. By applying appropriate tools, the market system can be made effective in environmental protection. Significant investments may be required, for instance, in emission reduction strategies to counter global warming trends before benefits can be reaped. Conversely, the 'cost' of environmental preservation measures can be offset by increased investments stemming from the adoption of new conservation technologies, opportunities for additional revenues, and cost avoidance due to pollution reduction.

The contemporary ecological policy must be subsidiarity-based, whereby the most effective level is chosen to implement policies. Many environmental protection issues will involve establishing global goals, namely uniform levels of international principles and ecological safety and quality standards. Political instruments should be decentralized at the national level, where they can most effectively account for the diversity of political, ecological, and social circumstances, including varying access and technology capabilities. Industry and economic activity need not necessitate identical frameworks and conditions everywhere, as differences in environmental provision should be considered as differences in traditional production factors.

The recent COVID-19 pandemic, which has caused shifts in human development across countries, continues to generate various trajectories unpredictably. Wars like those in Ukraine and other nations have caused more human suffering. Record temperatures, fires, storms, and floods signal increasingly disrupted planetary systems. Together, they fuel a crisis of the value of life felt worldwide, painting a picture of uncertain times and unstable existence.

Uncertainty is not new, but today its scale takes on sinister new forms. A new 'complex of uncertainty' emerges, unprecedented in human history. It comprises three interrelated strands:

- the destabilizing planetary pressure and inequality of the Anthropocene;
- the drive for radical societal transformations to alleviate this pressure;
- an exacerbated polarization.

This new complex of uncertainty and the crises it spawns obstruct human development and spark alarm across the globe. The significance of the global Human Development Index (HDI) fell for the first time during the pandemic, declining for two consecutive years. In many countries in 2021, the HDI decreased compared to 2020: Ukraine at 0.733 (-0.004), Switzerland at 0.962 (+0.006), and South Sudan at 0.385 (-0.003) (UNDP, 2023). Before the pandemic, feelings of vulnerability were increasing nearly everywhere. Many

people felt disconnected from their political systems, and in another democratic backslide, this alienation intensified.

In this new uncertainty and each crisis it breeds lies both a challenge and a promise. It obstructs human development and generates anxiety across the world. Amid the pandemic, the importance of the Global Human Development Index (HDI) dropped for the first time in two years. In many countries, the HDI declined in 2021 compared to 2020: Ukraine at 0.733

(-0.004), Switzerland at 0.962 (+0.006), and South Sudan at 0.385 (-0.003) (UNDP, 2023). Even before the pandemic, feelings of insecurity were growing almost everywhere. Many people felt alienated from their political systems, and in another turn of events, democratic regression deepened.

There is danger in this new uncertainty, polarization, and demagoguery that have gripped many countries. But there is also a promise - an opportunity to reconsider our future, renew and adapt our institutions, and create new stories about who we are and what we appreciate. It's a hopeful path forward, a path we must take to thrive in an ever-changing world.

Organizations and initiatives, like UNESCO's Development Diversity of Cultural Expressions (2005), have long called for the inclusion of culture within this framework (UNESCO, 2023). Culture is an additional factor, shaping our understanding of 'development' and influencing the actions of communities worldwide. The UNESCO Declaration on Cultural Diversity (2001) and the Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005) define the connection between culture and sustainable development in two specific ways:

- the development of the cultural sector in its own right and its economic dimension (cultural heritage, creative and cultural industries, crafts, cultural tourism, etc.);
- the recognition that culture plays a distinct role in all government policies, such as those related to education, economy, science, communication, environment, social cohesion, and international cooperation.

## 7. CONCLUSION

For sustainable development of economic systems in the face of exacerbated environmental issues, the primary significance lies in the availability of natural resources and competing forms of their utilization, which exist between the environment as a societal good and/or a waste repository. This establishes a scarcity of the environment as a good. Thus, a mandatory constraint is not only the presence of resources but also the limited assimilative capacity of the environment.

The next direction involves establishing target indicators for the quality of the environment as a societal good. These should be determined through a political process in the form of prices on emissions and the use of limited resources. Political instruments for waste management include private property rights (limits on disposal, permits, etc.), as well as waste charges.

Fundamental aspects of developing the economic foundation for sustainable economic system development encompass:

- Forming an effective incentive mechanism to support environmental protection.
- Mitigating risks associated with the production and processing of products.
- Utilizing renewable energy, safe waste disposal.
- Establishing consistent levels of international principles and standards of ecological safety and quality.

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