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# **MODERN SCIENTIFIC CHALLENGES AND TRENDS**

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### **NATURAL RESOURCES AND ENVIRONMENTAL MANAGEMENT AS AN ASPECT OF SUSTAINABLE DEVELOPMENT OF MANKIND**

**Abstract.** *The problems of nature management have always been important for humanity, but they have become most relevant in our time, when human economic activity has caused major changes in the natural environment throughout the planet. This is explained by a sharp increase in the world's population, excessive use of natural resources and the consequences of the scientific and technological revolution.*

**Key words:** *rational environmental management, natural resources, sustainable development, environmental pollution.*

Natural resources are the bodies and forces of nature that people use to sustain their existence. They include sunlight, water, air, soil, plants, animals, minerals and everything else that is not created by humans, but without which they cannot exist as living beings or as producers.

They are used as: direct objects of consumption (drinking water, air oxygen, edible and medicinal wild plants, fish, etc.); means of labour with which social production is carried out (land, waterways, etc.); sources of energy (hydropower, fossil fuel reserves, wind energy, etc.). In addition, natural resources are used for recreation, health improvement and other purposes [3].

Natural resources are classified according to the following criteria – by their use in production (agricultural and industrial), health (recreational), aesthetic, scientific, etc.; by their belonging to certain components of nature – land, water, minerals, flora and fauna, etc; replaceable (e.g., fossil fuels and mineral resources can be replaced by wind and solar energy)

and irreplaceable (the oxygen in the air we breathe or the fresh water we drink can be replaced by fresh water).

The division by use is very arbitrary, since the same resource, for example, water in a lake, can be used for industrial, agricultural and recreational purposes, or has a high aesthetic value. Inexhaustible resources include sunlight, atmospheric air, water, wind energy, waterfalls, etc. However, not only the quantity but also the quality of these resources is important: for example, not water in general, but drinking water; not air in general, but air suitable for breathing, etc.

Thus, even quantitatively inexhaustible resources may become unusable due to changes in their quality under the influence of human activity. Exhaustible natural resources are divided into renewable, relatively renewable and non-renewable.

The process of exploiting natural resources to meet the material and cultural needs of society is called nature management. It can be rational (reasonable) and irrational.

Sustainable development is the development of a society that allows it to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. Sustainable development is defined by the United Nations as the main direction of human civilisation in the 21st century, as any other path will inevitably lead to a global environmental catastrophe. Ukraine joined international initiatives, taking into account the main ideas and principles declared at the UN Conference on Environment and Development (1992). A process of change has been launched aimed at preserving the properties of natural components and the country's natural resource potential [1, 6].

An indispensable component of sustainable development of society is rational environmental management, which ensures the conservation of natural resources.

Rational environmental management means careful study, use, protection and reproduction of natural resources, taking into account not only current but also future interests of the national economy and human health.

The main areas of rational environmental management are as follows

- integrated use of mineral and raw material resources and utilisation of production waste
- introduction of resource-saving equipment and technologies, environmentally friendly transport
- widespread use of secondary raw materials in various areas of economic activity
- restoration of land fertility;
- effective regulation of forest use, maintenance of forest productivity, active reforestation;
- environmental monitoring;
- preservation of recreational resources, expansion of the nature reserve fund and ecological network [2-5].

In most cases, the current state of natural resource management can be described as irrational, leading to the depletion (up to the point of disappearance) of natural resources, even renewable ones, and environmental pollution. There are several reasons for this. They include insufficient knowledge of the laws of ecology, weak material interest of producers, low environmental culture of the population, etc.

The anthropogenic cycle of substances is accompanied by high consumption of natural resources and a large amount of waste, which causes environmental pollution. Therefore, the main task is to develop technologies that allow us to close the anthropogenic cycle as much as possible, the so-called low-waste, low- and no-waste technologies.

A low-waste technology is a production method that ensures the most efficient use of raw materials and energy with minimal waste and energy losses. An important condition for low-waste technology is recycling – the reuse of material resources, which saves raw materials and energy and reduces waste [2, 4].

Biotechnology is the methods and ways of obtaining products, phenomena and effects useful for humans with the help of living organisms (mainly microorganisms) [2, 4].

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