

ANALYSIS OF THE MAIN FACTORS CAUSING ENVIRONMENTAL PROBLEMS

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Annotation. Environmental problems have become one of the major challenges affecting the sustainable development of human society and natural ecosystems. Increasing pressure on natural resources, rapid population growth, expansion of agricultural and industrial activities, urbanization, improper waste management, deforestation, and climate change have intensified ecological degradation in many regions. The interaction of these factors can reduce soil fertility, deteriorate water and air quality, decrease biological diversity, and weaken the natural capacity of ecosystems to recover from disturbances. This article analyzes the principal anthropogenic and natural factors contributing to environmental problems and examines their relationships with ecosystem stability. A qualitative analytical approach based on scientific literature and environmental assessment principles was used.

Keywords: environmental problems, environmental degradation, natural resources, pollution, soil degradation, water resources, biodiversity, deforestation, climate change, sustainable development.

INTRODUCTION. The natural environment provides the fundamental conditions necessary for human existence, agricultural production, economic development, and the functioning of ecosystems. Soil, water, atmospheric air, forests, grasslands, and biological resources form interconnected systems in which changes in one component can influence the condition of others. Consequently, environmental

degradation should be considered as a complex process rather than as a collection of isolated ecological problems. During recent decades, the pressure exerted by human activities on natural systems has increased considerably. Population growth, urban expansion, industrialization, agricultural intensification, transportation, extraction of natural resources, and increasing consumption have transformed landscapes and altered natural cycles. Although technological development has improved living standards and production capacity, insufficient environmental control can cause significant ecological consequences.

MATERIALS AND METHODS. The study was conducted using a qualitative analytical approach. Scientific publications, environmental assessment concepts, and information concerning major ecological processes were reviewed and synthesized to identify the principal factors responsible for environmental degradation.

For analytical purposes, environmental pressures were classified into two broad groups:

1. anthropogenic factors, associated directly or indirectly with human activities;
2. natural factors, resulting from natural environmental processes. The analysis focused on the relationship between these factors and the following environmental components:
3. soil resources;
4. water resources;
5. atmospheric air;
6. biological diversity;
7. forest and vegetation ecosystems;

8. landscape stability.

The conceptual relationship can be expressed as:

Environmental pressure → ecosystem disturbance → resource degradation → ecological and socio-economic consequences. The comparative analysis was used to determine which factors have direct effects on environmental quality and which factors amplify the consequences of other environmental pressures.

RESULTS AND DISCUSSION. Agriculture is essential for food security, but intensive production can become a source of environmental pressure when natural resources are used without adequate management. Continuous cultivation of the same crop, excessive soil disturbance, insufficient organic matter replenishment, inappropriate irrigation, and unbalanced fertilization can reduce soil quality. Intensive farming may accelerate erosion and contribute to the decline of soil biological activity. Irrigation agriculture can create additional risks when water application exceeds the water-holding and drainage capacity of the soil. Under poorly managed conditions, soluble salts may accumulate within the root zone, gradually reducing soil productivity. Agricultural intensification can therefore have a dual character: it increases production capacity in the short term but may undermine the resource base when soil, water, and biological resources are not managed sustainably. Industrial development is an important component of economic growth, but industrial activities can generate environmental pollutants through energy consumption, manufacturing processes, mining, chemical production, and wastewater generation. Atmospheric emissions may contain particulate matter and various gaseous substances. Industrial wastewater may contain organic compounds, nutrients, salts, metals, or other contaminants depending on the production process. The ecological significance of industrial pollution depends on the quantity and toxicity of released substances, their persistence, environmental mobility, and the effectiveness of treatment systems. The

transition toward cleaner production technologies, energy efficiency, closed-loop water systems, and improved waste treatment can reduce industrial pressure on ecosystems.

Table 1. Major environmental pressures and their consequences

Major factor	Primary environmental effect	Potential long-term consequence
Agricultural intensification	Soil and water degradation	Reduced land productivity
Industrial pollution	Air, soil and water contamination	Ecosystem disturbance
Urban expansion	Habitat loss and land-use change	Landscape fragmentation
Deforestation	Erosion and biodiversity loss	Ecosystem instability
Excessive resource extraction	Resource depletion	Reduced resource availability
Poor waste management	Pollution and habitat degradation	Accumulation of persistent pollutants
Fossil-fuel consumption	Atmospheric pollution and greenhouse gas emissions	Climate-related changes
Excessive irrigation	Water depletion and salinization	Declining agricultural productivity

CONCLUSION. Environmental problems are the result of a complex interaction between human activities and natural processes. The analysis demonstrates that agricultural intensification, industrialization, urbanization, deforestation, excessive exploitation of natural resources, inappropriate waste management, energy consumption, and inadequate environmental governance are among the principal factors contributing to ecological degradation. The consequences are interconnected. Soil degradation can influence water quality and agricultural productivity; deforestation can accelerate erosion and biodiversity loss; urbanization can increase waste and modify natural hydrological processes; and climate change can intensify existing environmental pressures.

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