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MODERN ENVIRONMENTAL ISSUES AND THEIR SOLUTIONS IN THE CONTEXT OF SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT

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It can be said that the rapid development of science and technology has turned the 21st century into an era of environmental issues. Today, humans are increasingly exploiting natural resources to enhance their economic power and improve their quality of life. This is undoubtedly an integral part of civilization's progress. However, to manage this process correctly, humans must deeply understand and adhere to ecological principles. Otherwise, ecological balance may be disrupted, leading to severe environmental crises for humanity.

As human society advances, the impact of anthropogenic factors on the environment is increasing. In recent years, this influence has extended beyond the biosphere, reaching a cosmic scale. As a result, maintaining environmental cleanliness has become a global challenge. Accordingly, the tasks of ecology as a science have expanded, and the need to establish an ecological standardization system has emerged. Ecological standardization refers to defining acceptable limits of anthropogenic impact on the environment.

The concept of ecology is now widely used and is often considered synonymous with environmental protection. However, these two concepts differ: ecology studies the interconnections within nature, while environmental science focuses on addressing problems arising from human activities. Therefore, a highly educated specialist must be able to distinguish between these two fields correctly.

The concept of the environment encompasses natural, social, and artificially created physical, chemical, and biological factors that influence human life activities. Human living conditions vary and consist of the following components:

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- Informational environment – a set of visual and auditory information that affects human consciousness.

- Minimal environment – a set of the minimum essential factors necessary for human life.

- Physiological environment – a complex of factors crucial for the development of the human body.

- Ecological environment – an environment related to the impact of natural conditions on human life.

One of the ways to combat negative ecological factors and improve the environment is through the cultivation of green plants. From this perspective, the plant *Crotalaria juncea* holds particular importance. This plant is highly effective in enhancing soil fertility and preventing erosion. *Crotalaria juncea* has nitrogen-fixing properties, helping restore the nitrogen balance in the soil and enriching it with organic matter. Additionally, it can be used as a biofertilizer, reducing the need for chemical fertilizers. This, in turn, plays a significant role in improving the ecological environment and contributes substantially to environmental protection.

Thus, in order to eliminate the environmental problems arising from human activities today, it is necessary to follow scientifically based approaches and adhere to ecological standards. Additionally, utilizing beneficial plants such as *Crotalaria juncea* can help maintain the stability of soil and atmospheric conditions. This plays a crucial role in addressing ecological challenges.

Living conditions consist of the environmental components essential for the survival of organisms and directly affect them. Any ecological condition is shaped by specific factors and is considered one of the key aspects related to the living environment of organisms. Ecological factors in nature do not act separately but are interconnected and collectively determine the living conditions of organisms. Different organisms respond to these factors in various ways. For example, heat-loving plants cannot thrive in cold climates, whereas cold-resistant plants do not grow well in hot regions. Likewise, marine and oceanic fish adapted to saline water cannot survive in freshwater.

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As a result of human economic activity, biodiversity is under serious threat. According to studies, many plant and animal species have disappeared in recent centuries. Today, about 10 species of animals and 1 species of plants are disappearing every day and every week. The disappearance of one plant species can also lead to the disappearance of an average of 30 species of insects and nematodes from the natural environment. Therefore, various measures are being taken internationally to preserve plant and animal species. Rare and endangered species are included in a special Red Book, and it is important to develop their population, distribution area and protection measures.

Among the plants, there are also species useful for human activity and agriculture. For example, Crotalaria juncea is one of the legumes that is widespread in tropical and subtropical regions and plays an important role in increasing soil fertility. This plant has nitrogen fixation properties and is also widely used as an organic fertilizer. Crotalaria juncea helps protect the soil from erosion, improve its structure, and increase the activity of microorganisms. This plant fiber is also famous for its strength and is used in paper production.

The interdependence between society and nature poses constant challenges to humanity. Nature conservation and sustainable development of the environment depend on human intelligence and proper management measures. Man, with his scientific approach, should use natural resources wisely and implement effective measures aimed at protecting the environment.

In conclusion, ecology is an important science that studies the living environment of organisms and its structural elements. The interrelationship of ecology with biology, chemistry, physics, and other sciences allows for a deeper understanding of the natural environment. To ensure harmony between humans, society, and nature, it is necessary to maintain ecological balance and achieve sustainable development.

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