

# THE EVOLUTION OF ENVIRONMENTAL EDUCATION AS A DRIVER FOR IMPROVING THE TECHNOLOGIES OF MANAGING THE USE OF NATURAL RESOURCES

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## Abstract

**Purpose of the study:** The aim of the article is to develop proposals for improving environmental education management technology.

**Main Findings:** Analysis of the approaches used in the theory and practice of environmental education management has shown that it is most appropriate to form the development, consistency, and self-organization principles, as well as data of modern natural science and individual areas of ecology, namely, general ecology, human ecology, global ecology, and social ecology. It is revealed that additional important sources of environmental education should include geological ecology, engineering ecology, agroecology, and some other environmental disciplines.

**Applications of this study:** It is proved that the introduction of special courses at various levels of education, which integratively reflect the content of new environmental disciplines, becomes a mandatory requirement. In this context, distinguishing the key concepts, which reflect the invariant phenomena and processes in different areas of ecology, in environmental education is quite essential. This allows justifying the internal unity of environmental disciplines and determining the optimal form of presentation of educational information.

**Novelty/Originality of this study:** It is revealed that environmental education should be aimed at the development of environmental consciousness and education of the individual with an environmental outlook. Accordingly, environmental education should be continuous, systematic, and interdisciplinary. It should be supplemented by various sources of up-to-date information.

**Keywords:** *Technology, Management, Ecological Education, Water Biological Resources, Society, Orientation, Nature, Activity.*

## INTRODUCTION

Based on numerous comprehensive studies, it is obvious that the world has come to the threshold demanding a radical change of value orientation of each person and mankind in general, observance of a priority of natural prerequisites in natural and historical development (Hellqvist, 2019; Blatti et al., 2019; Boyd, 2019; Hirst, 2019; Bascopé, Perasso and Reiss, 2019; Sawitri, 2017). Therefore, the problem of the relationship between society and nature is one of the eternal problems of mankind. In each era, based on the achieved level of knowledge in various fields, mankind, in varying degrees, has optimized its relationship with the natural environment. And now one can talk about qualitatively new technologies that practically do not pollute the environment, about successes in the effective use of solar energy, and the development of environmentally friendly modes of transport (Johnson, et al., 2019; Mahzun and Kalalo, 2019).

But all this appears in a different light in connection with the awareness of the need to harmonize the socio-economic and environmental development of civilization. Such a deep understanding of the unity of environmental and development issues was not characteristic to the society even 30 years ago when most futurists considered it necessary to stop the growth of population, production, and technology to preserve the natural environment. It is no exaggeration to say that the solution to the problems of interrelated development of the socio-economic sphere and the natural environment will have a significant impact on human activity, and it's content in a variety of areas.

All this is unthinkable without a corresponding transformation of social consciousness, understanding by each individual of the meaning and significance of the upcoming changes. Therefore, the issues of socialization of the younger generation, changes in the orientation and content of educational systems both on a national and global scale from the standpoint of sustainable development come to the fore. The keynote idea of all these transformations is the search for forms and ways of penetration of ecological knowledge and imperatives into various levels of educational structures, i.e. their total greening. Targeted environmental education is of particular importance since it becomes a foundation, a prerequisite for the greening of the entire education system.

## LITERATURE REVIEW

The study of issues related to environmental education found its reflection in the works of E.R. Barieva (2014), G.B. Baryshnikova (2013), E.A. Grineva (2013), E.V. Kolesnikova (2014), Kh.O.S. Sultanly (2015), L.K. Trubina (2015), and others. Analysis of the literature on the research topic allows identifying contradictions, which prove the need to improve environmental education management technology. However, the recognition of the need for environmental education has not led to an adequate understanding of its theoretical foundations. Attention was focused mainly on issues, such as pollution, depletion of resources, etc.

Scientists (Agamirova et al., 2017, Karpov et al., 2017, Nikiforov et al., 2018) believe it possible to consider issues that are vital for society on the basis of common sense without the application of the appropriate scientific methodology. But at present, such an ineffective approach is hardly acceptable. In this case, the social activity of people associated with the emotional perception of environmental conflicts, in fact, overshadowed the scientific and theoretical aspect of the problem concerning the interaction between society and nature.

The diversity and complex differentiation of modern environmental knowledge raise serious questions for the education system: what should be selected as the basis for university programs, to what extent should specialists in different fields have knowledge of environmental issues, and on what aspects - social or biological, and what in particular should be prioritized? There is no consensus on these issues.

## METHODS

### a. General description

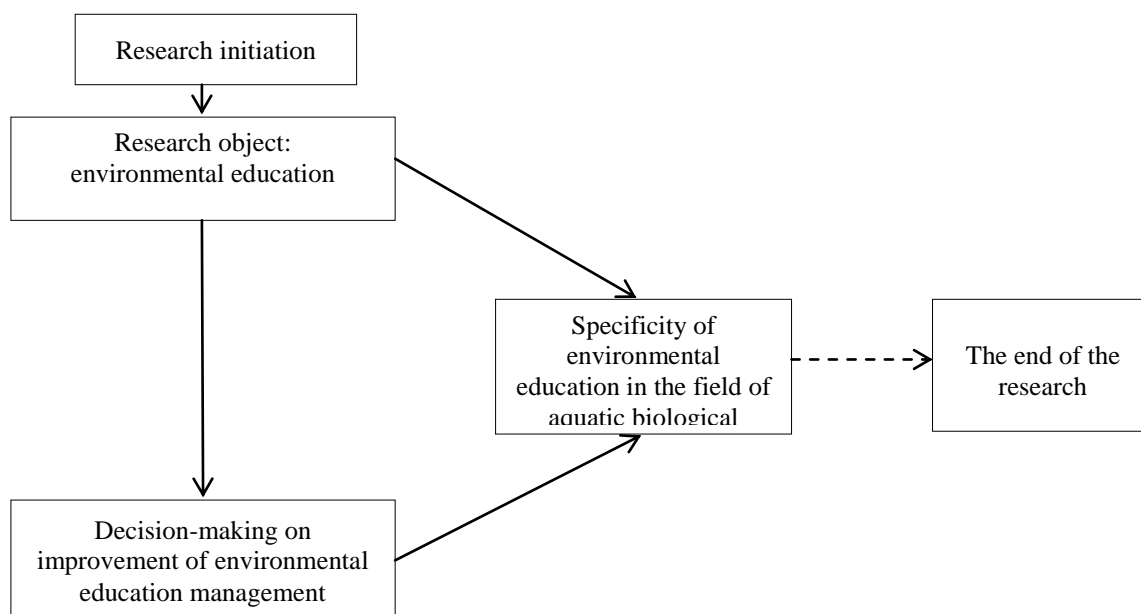
Analysis of the approaches used in the theory and practice of environmental education management has shown that it is most appropriate to form the development, consistency, and self-organization principles, as well as data of modern natural science and individual areas of ecology, namely, general ecology, human ecology, global ecology, and social ecology. The information base of the article includes the statistical data of state bodies, legislative and regulatory documents, regulating the technologies of environmental education management, as well as the research findings (Abanina et al., 2018, Kosevich et al., 2018, Mukhlynina et al., 2018).

### b. Algorithm

In the course of the study, it is planned to identify the reasons for the weak effectiveness of modern environmental education with respect to the condition of the natural environment, and the degree of environmental literacy. These reasons lie in the lack of development of scientific and theoretical foundations of environmental education, the vagueness of its content, and the lack of appropriate standards in this area.

### c. Flow diagram

The study is planned to be carried out according to the following flow diagram, in which the environmental education management is considered as a dynamic process that provides the formation of parameters for the development of socio-economic relations (Figure 1).



**Figure 1:** Flow diagram of environmental education management at the present stage.

## RESULTS

The issues of what should be the content of environmental education in the university, what areas of science should determine its basis, how should relate science, art, literature, and mass media in the formation of environmental consciousness, are still remaining open. At the same time, the need for environmental education is associated with the need to provide a favorable environment for human life, because the quality of the environment determines human health, as the basic constitutional right. At that, without natural prerequisites, all social issues lose their meaning.

Therefore, environmental education should not just penetrate into the structure of the education system, but become one of its most important foundations. Environmental education is necessary to form a truly human attitude to nature, to determine the permissible measures of the transformation of nature, the assimilation of specific socio-natural laws and standards of behavior, which ensure continued human existence and development.

At the same time, the global problems of modern times and, above all, the sharp aggravation of the environmental problem, have put mankind before the task of finding new ways of development and restructuring its relations with the environment. Humanity has come to realize the need to reform the basic principles of life, material, and spiritual culture, as well as social practice in general.

Therefore, the solutions to global problems should become the basis of the planetary unity of mankind, the basis for the establishment of the principles of reason, good, and justice among peoples. In the face of global dangers, everything that separates people must recede into the background. Such a new order will necessarily require the creation of appropriate global structures that would be able to assume the functions of the coordinated development of mankind without prejudice to national interests.

Studies show that a new syncretic culture is being formed. It is referred to as the formation of a single culture that exists and develops through the interaction and mutual enrichment of traditional national cultures. The establishment of this idea in the public consciousness is associated with the strengthening of humanistic ideas, the integration of social and cultural processes in the world. The modern era is characterized by the formation of a unified system of socio-economic, political, and other ties and relations in the world.

All this confirms the validity of the statement that humanity can live only as a consolidated community in accordance with the integrity of the biosphere. In this aspect, the most important task facing the world community is the transition to the noospheric development path, which involves, first of all, the unity of actions of all the peoples in the world. The natural basis of this unity is the task of preserving the biosphere as a common basis of life on the planet. At the same time, the implementation of this task will mean the movement of society towards the formation of the noosphere.

The doctrine of the noosphere performs a methodological function in relation to the concept of sustainable development. The final result of the transition to the path of sustainable development should be the formation of the noosphere as a socio-natural system, in which the priorities of moral reason, intellectual and information values, and eco humanism will be provided; as well as the harmony of man, society and nature, their safe and indefinitely long development will be realized. At the same time, the transition to the sustainable development of the noosphere orientation objectively gives priority to spiritual and information factors in the future managed development, since all such transition should not be spontaneous, but be aimed at the harmonization of socio-economic and environmental development.

The transition to sustainable development depends, among other things, on the type of person that will be shaped by society. The development level of individual consciousness, moral ideas of man, the nature and breadth of his interpersonal relationships, and the degree of involvement in social life determine the values and motives of human life. These components are necessary to form the so-called responsible consciousness of the individual and are given by society through education and training.

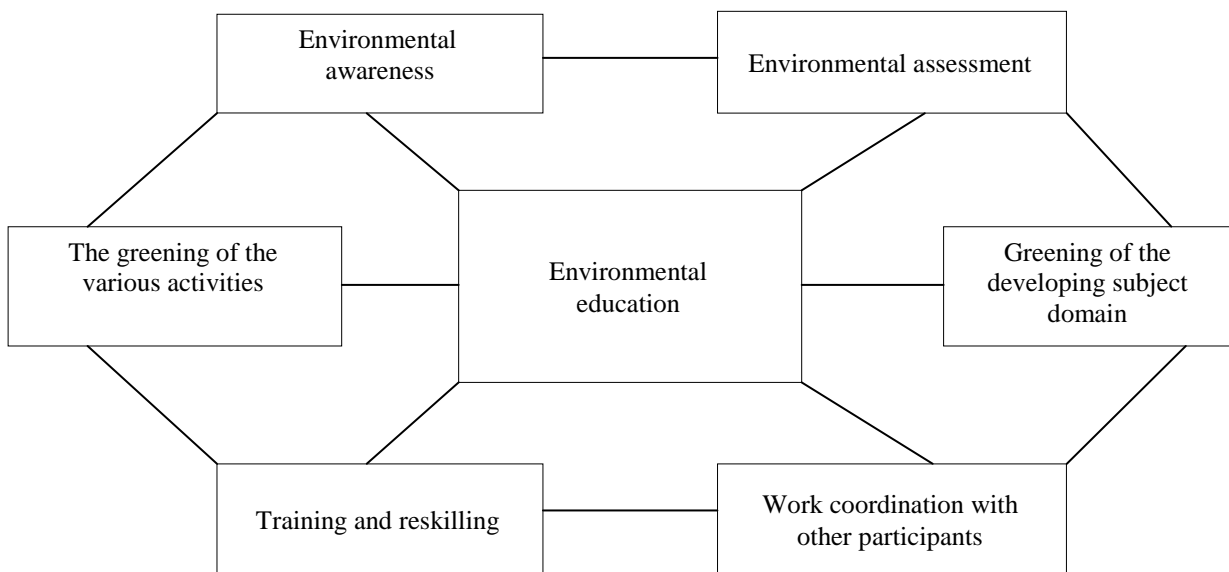
Environmental education in the context of the sustainable development concept acquires the status of a system-forming factor of education in general, determines its strategic goal and leading directions in the framework of the global environmental crisis (Figure 2).

The global environmental crisis is not the result of a single mistake, a wrongly chosen strategy of technical or social development. This is a reflection of the deep crisis of culture, covering the whole complex of human interactions with each other, with society and nature.

The way out of the crisis is seen in the development of new value relations that allow overcoming the alienation of man from nature, developing an ecological worldview and the imperatives of interaction between society and nature. These new trends and orientations in the change of cognitive, value-based attitudes in modern society should be supported and developed by the system of continuous environmental education. At the same time, the existing education based on analytical knowledge about nature, consumer-oriented, could not break the destructive attitudes of a significant part of the population.

This indicates the need for a fundamental change in the education methodology. Such education should give people clear and reasoned knowledge of the basic principles and laws of interaction among people, society, and nature. In this regard,

environmental education should be aimed at the formation of a human worldview based on the ideas of unity with nature, and the focus of culture and all human practice on its development, which will contribute to the development of society, rather than be focused on the exploitation of nature or even its preservation in original form.



**Figure 2:** Management of environmental education in a higher-education system.

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At the same time, until recently, due to the exceptional difficulty of research, diverse biological resources have remained poorly studied, while, for example, ideas about the prospects for further environmental education in the development of the fish industry and fisheries are very contradictory. In addition, in many countries, there is a growing interest in the use of biological resources, caused by the increasing shortage of protein food for the rapidly growing global population and the long-standing opinion about the significant potential of bioproductive opportunities of the hydrosphere.

Intensive and at the same time rational use of aquatic biological resources, as is well known, can contribute to a significant improvement in the diet of the population of the planet. A significant part of the protein food resources consumed by mankind comes from inland waters. Favorable conditions for the development of populations of plant and animal organisms allow us to consider freshwater bodies of water as a permanent and sustainable source of valuable food resources.

Currently, there are many ways of environmental education, aimed at a significant increase in the consumption of various biological resources of inland waters through the more efficient use of these resources. To solve this problem, the following ways can be identified: the development and improvement of fisheries; management of multi-species fishing ecosystems; and improving river aquaculture. Almost all these areas acquire their significance only in the case of properly organized environmental education.

Such opportunities, based on modern ideas about the dynamics of the biomass of fish and large aquatic invertebrates, are quite real and are evaluated quite high in the current conditions.

The problem of launching non-traditional fishing objects into commercial orbit is also largely a function of environmental education since people's stereotypical ideas about traditional dishes are often based on a lack of information. In this aspect, intercultural communication in combination with scientifically-based projects to improve dietary intake is becoming increasingly important.

Until now, unfortunately, human exposure to populations of fish living in river bodies of water has been very one-sided and, as a rule, has led to a serious deterioration of their habitat, a decrease in population and breeding efficiency, as well as an underutilization of food potential.

World practice has shown that environmental education can be used not only as a powerful directional influence factor to increase the efficiency of fish as an object of nutrition but also as a social motivator for the large-scale biological rehabilitation of river watercourses and other freshwater bodies of water.

At the same time, it is noted that in some river areas processes often occur that lead to the replacement of some of the numerous objects with other objects that have similar power. At the same time, fluctuations in the number of many of them are inversely related. However, their total production provides a comparable catch by year. This model not only makes it possible to establish the trend of expected changes in the structure of multiple species ecosystems, their composition, and estimated yield but also makes it possible to purposefully influence the ecosystem and its fishing components in the direction desired by humanity.

In general, it should be noted that the current level of intensity of human impact on wildlife has reached such a magnitude that it becomes extremely important for any business entity to understand the possible consequences of its activities for the ecosystem. Therefore, regardless of the sphere of nature management (withdrawal of aquatic biological resources, forest industry, agriculture, mining, etc.), the training of a specialist must necessarily include the most diverse aspects of environmental education.

## CONCLUSION

Summing up, it can be noted that the scientific basis of an ecological education includes classical ecology, the ecology of man and society. Additional important sources should include geological ecology, engineering ecology, agroecology, and some other environmental disciplines. Hence, the insufficiency of a simple modification of the existing education system for the formation of ecological consciousness becomes obvious. It is mandatory to introduce special courses at various levels of education that integratively reflect the content of new environmental disciplines.

In this aspect, it is essential to highlight the key concepts in environmental education that reflect the invariant phenomena and processes in different areas of ecology. This allows justifying the internal unity of environmental disciplines and determining the optimal form of presentation of educational information. Such concepts include ecosystem, eco-interaction, eco-contradiction, eco-development, and eco-sustainability.

Therefore, environmental education should be aimed at the development of environmental awareness, education of the individual with an environmental outlook. Accordingly, environmental education should be continuous, systematic, interdisciplinary, and be supplemented by literature means. These principles, as well as the principles of regional nature, are designed to determine the basis of the educational process in higher education.

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