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ИЗВЕСТИЯ

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК
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NAS RK is pleased to announce that News of NAS RK. Series of geology and technical sciences scientific journal has been accepted for indexing in the Emerging Sources Citation Index, a new edition of Web of Science. Content in this index is under consideration by Clarivate Analytics to be accepted in the Science Citation Index Expanded, the Social Sciences Citation Index, and the Arts & Humanities Citation Index. The quality and depth of content Web of Science offers to researchers, authors, publishers, and institutions sets it apart from other research databases. The inclusion of News of NAS RK. Series of geology and technical sciences in the Emerging Sources Citation Index demonstrates our dedication to providing the most relevant and influential content of geology and engineering sciences to our community.

Қазақстан Республикасы Ұлттық ғылым академиясы «ҚР ҰҒА Хабарлары. Геология және техникалық ғылымдар сериясы» ғылыми журналының Web of Science-тің жаңаланған нұсқасы Emerging Sources Citation Index-те индекстелуге қабылданғанын хабарлайды. Бұл индекстелу барысында Clarivate Analytics компаниясы журналды одан әрі the Science Citation Index Expanded, the Social Sciences Citation Index және the Arts & Humanities Citation Index-ке қабылдау мәселесін қарастыруда. Web of Science зерттеушілер, авторлар, баспашылар мен мекемелерге контент тереңдігі мен сапасын ұсынады. ҚР ҰҒА Хабарлары. Геология және техникалық ғылымдар сериясы Emerging Sources Citation Index-ке енуі біздің қоғамдастық үшін ең өзекті және беделді геология және техникалық ғылымдар бойынша контентке адалдығымызды білдіреді.

НАН РК сообщает, что научный журнал «Известия НАН РК. Серия геологии и технических наук» был принят для индексирования в Emerging Sources Citation Index, обновленной версии Web of Science. Содержание в этом индексировании находится в стадии рассмотрения компанией Clarivate Analytics для дальнейшего принятия журнала в the Science Citation Index Expanded, the Social Sciences Citation Index и the Arts & Humanities Citation Index. Web of Science предлагает качество и глубину контента для исследователей, авторов, издателей и учреждений. Включение Известия НАН РК. Серия геологии и технических наук в Emerging Sources Citation Index демонстрирует нашу приверженность к наиболее актуальному и влиятельному контенту по геологии и техническим наукам для нашего сообщества.

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**GEO-ECOLOGIZATION OF TOURISM AS A FACTOR OF SUSTAINABLE
DEVELOPMENT OF TOURISM REGIONS**

Abstract: the article considers the geoeologization (knowledge, comprehension of geoeology as a science) of tourism as a factor in the sustainable development of the tourist region. The definitions of the concept of "geoeology" are compared. Approaches to the allocation of the object and subject of geoeology are proposed. The object of geoeology research is the environment - an interacting set of natural and technogenic substances, bodies, conditions, factors that directly or indirectly influence the development of tourism. As the subject of geoeology research, geoeological processes are considered (changes in the health and vital functions of people, changes in the state of plant and animal organisms under direct or indirect environmental influences). The definition of the concept of geoeological tourism is formulated. The goal, objectives of geoeological tourism and the forms of their implementation are determined. The prospects for the development of geoeological tourism through the harmonization of norms and requirements of geoeological policy and geoeological education are outlined.

Key words: geoeology, geoeologization of tourism activities, environment, tourism potential, sustainable development of tourist regions, natural resources, geoeological policy.

Introduction. Global changes taking place in the world community, as well as accelerating the pace of scientific and technological progress, necessitate the search for optimal structural approaches to achieve a stable geo-ecological balance between humanity, the earth and the environment. At the present stage of social development, geo-ecology, as evidenced by studies of foreign and domestic scientists from various fields of knowledge, should, first of all, be studied in the context of socio-economic nature, man and society. From the point of view of state regulation, geo-ecology as a science has practical implantation, primarily in the form of environmental activities. [1]

"Geo-ecology" is an interdisciplinary scientific field combining studies of the composition, structure, properties, processes, physical and geochemical fields of the Earth's geospheres as a human environment and other organisms. [2] The main objective of geo-ecology is to study changes in the life-supporting resources of geosphere shells under the influence of natural and anthropogenic factors, their protection, rational use and control in

order to preserve a productive natural environment for present and future generations of people.

One of the basic concepts of geo-ecology is the concept of "natural environment", which is a complex of geo-shells of the Earth that are in conditions of relative thermodynamic equilibrium. The natural environment includes the near outer space, the Earth's atmosphere, the World Ocean, the inner hydrosphere, the cryosphere and the active layer of the lithosphere. [3]

Summarizing the above definitions of geoeology, one should mention such an established concept in physical geography as "geographical envelope" - a natural complex that arose in the layer of interaction and interpenetration of the lithosphere, hydrosphere, atmosphere and biosphere, and formed under the influence of solar energy and organic life. [4] This shell is the natural environment of a person in his life and economic activity, and the first and second lies at the heart of regional tourism. Since geo-ecology allows you to solve the following problems:

- study of the sources of anthropogenic impact on the environment and the biosphere, their intensity and spatial-temporal distribution;

- creation and optimization of geographic information systems that provide continuous monitoring of the environment (biosphere), which are based on various types of monitoring, the results of such monitoring may underlie the formation of tourist demand and supply;

- the study of the level of pollution and destruction of the components of the global system (atmosphere, oceans, inland waters, lithosphere, cryosphere, biosphere), constant and universal monitoring of their dynamics makes it possible to identify regions that are safe for tourism development;

- the study of the anthropogenic load on natural landscapes and their functioning as ecosystems, the normalization and regulation of loads on ecosystems of different hierarchical levels, the study of the reaction of the biosphere to anthropogenic processes of various nature contribute to effectively distribute the recreational load of the tourist region;

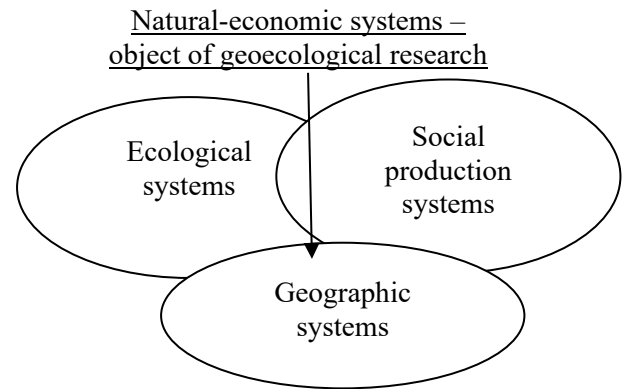
- assessment, forecasting and modeling of the effects of anthropogenic impacts, manifested in a change in the state of components of the global and regional ecosystems, in a change in the intensity of heat-mass-energy exchange between them for different time scales;

- geological study of the sustainability of the natural environment subjected to anthropogenic impact;

- development of recommendations for maintaining the integrity of the natural environment and the biosphere by optimizing economic activity and regulating resource consumption.

Geo-ecological problems, as a rule, are complex, require the integration of geology, geography, soil science, geophysics, geochemistry, mining, regional studies, ecology into a single system of knowledge about the geological environment. [5] Covering information about the Earth, geo-ecology is not just a summing up, but a generalizing field of knowledge. It has its own object and subject of research, which does not follow from the theory of any particular earth science. [6]

Thus, geo-ecology is interpreted quite widely and varied. In a narrow sense, it is a science that studies the environmental functions of private geospheres and the problems associated with human activities. In a broad sense, geo-ecology considers natural-economic systems forming the object of geo-ecological research, including environmental, social-production and geographical systems (Figure 1).



Tourism, despite its close interaction with the environment, is an industry that uses a large number of species of various natural resources. Consequently, along with positive socio-economic circumstances, uncontrolled environmental impact arises in the process of tourist and recreational activities.

The use of the activity approach in studying the features of geo-ecological tourism has its own specifics, since by its nature geo-ecology is a complex science that studies the interaction and, accordingly, the interaction of anthropogenic activity and the surrounding, surrounding landscape or geo-space (depending on the scale of the geosystem). [7] This refers, first of all, to the positive, healing effect of nature on recreants or tourists and the impact of the latter on the environment as a result of tourist activities and leisure. It is important to emphasize the fact that geo-ecological policy, at the present stage of development of public relations, should become an important and effective tool for influencing the economic processes taking place in various sectors and sectors of the national economy of any country. The goal of such a geo-ecological policy should be not only environmental protection and restoration of natural conditions for human habitation (land reclamation, afforestation, etc.), but also stimulation of the business sector and households to introduce modern innovative technologies that minimize environmental damage. [8] Special attention should be paid to the harmonization of norms and requirements of geo-ecological policy and geo-ecological education, which should cover all levels of education in our country, contributing to the formation of the correct self-awareness of our citizens.

Geo-ecological policy should also focus on the problems and characteristics of specific industries, take into account the specifics of regional development, and be adapted to specific time conditions. [9] The geo-ecological policy is of particular importance in the context of the service economy, as it allows to some extent solve the

dilemma between the continued uncontrolled growth of consumption and the reduction of the natural resource base.

An even more difficult task is to form the foundations of a geo-environmental policy that would create favorable conditions for achieving high rates of economic growth and increasing the level of well-being and social satisfaction of the population. As a solution to such a difficult task, many leading experts and scientists propose the greening of the economy, which is a process of systematic implementation of environmental business standards on a national scale.

As an analysis of domestic and foreign experience shows, most of the definitions for the interpretation of the term “greening” apply to the economic system as a whole and involve a series of actions for the evolutionary transition to a “green economy”, which should become an alternative to modern post-industrial society. [10]

However, according to the authors, greening should be considered in relation to specific areas of the economic life of the country and society. Thus, the development of the theory and methodology of the ecologization of tourism activities on the basis of an integrated systematic approach, taking into account the inextricable connection with the ecologization of the entire socio-economic space, is very relevant. [11]

Within the framework of state regulation of the sphere of recreation and tourism in the Republic of Kazakhstan, the standards of both ecologization and geoecologization of tourism activities should be introduced in the form of targeted programs and long-term plans, which in their basis should be based on innovative experience in domestic and foreign practice and mandatory consideration of regional social-economic specifics, features of the tourist and recreational potential of the territories.

At the same time, there is a need for the creation and testing of unified theoretical and methodological approaches to the definition of “geo-ecologization of tourism” as a general scientific category, to expand the understanding of the directions and forms of ecologization as a socio-economic category.

There is a lack of research on the theory of state regulation of the tourism geo-ecologization process at the republican and regional levels, on the development of effective tools for government support for the creation and implementation of environmentally friendly technologies and products as part of the implementation of geo-environmental policies in the field of recreation and tourism.

There are practically no works reflecting methodological approaches to the formation of a system of quantitative indicators of socio-economic

assessment of the process of geo-ecologization of tourism as an integral part of the ecologization of economic systems.

It seems necessary to carry out applied research on the regulatory process, state support, and stimulate business initiatives to introduce environmentally friendly products and technologies within the strategic priorities of sustainable development of the sphere of recreation and tourism in each specific region or destination in our country.

Methods. The theoretical and methodological basis of the study was the scientific works of Kazakhstan and foreign scientists on the role of geo-ecological tourism as a factor in the sustainable development of tourist regions. The information base of the study was the legislative and regulatory acts of the Republic of Kazakhstan and other states, official statistical materials of the Agency of the Republic of Kazakhstan on statistics, as well as other electronic information resources of international, foreign and Kazakhstan institutions, support and development of tourism based on the clustering of tourist regions.

In the course of the study, the following methods were used: monographic (when collecting data from the primary documents of the existing tourism infrastructure); grouping method (when grouping enterprises according to homogeneous attributes); design and construction (when calculating indicators for the medium and long term); economic and mathematical methods (in the formation of models and options for tourist clusters).

Results. Tourism does not have such a negative impact on the environment, such as emissions from industrial enterprises or household waste in large cities. However, for a particular tourist destination or recreational area, tourism as a public phenomenon may pose a certain threat in terms of preserving the primary state of the environment and its inhabitants.

Most often, the negative consequences of the development of the tourism industry are noted in those cases when the formation of the tourist space and the servicing of tourist flows occurs without control by the local authorities and without taking into account the elementary requirements of geo-ecological safety. The negative impact in this case will be facilitated by the lack of adequate financial and production resources, the low level and lack of qualifications of the labor force involved in the construction and creation of tourist infrastructure facilities, as well as the seasonal uneven nature of the arrival of tourists [6].

The degree of environmental change in tourist destinations will depend on a number of factors:

-the correct organization of tourism activities;

-planning the development and modernization of tourist infrastructure in accordance with generally accepted international quality standards;

- the strategic concept of managing tourist flows, taking into account the priorities of the choice of potential consumers of tourist services and the seasonality factor;

- level of tourists' knowledge about the basics of nature management and geoecology;

- resistance of the geo-ecosystem to negative human influences.

The socio-economic consequences of the increase in the intensity of tourist flows in recent decades, both in traditional tourist regions and in new tourist destinations, especially in developing

countries, have attracted the attention of many domestic and foreign scientists to the study of this problem. [8]

An important role in terms of the impact of tourism on the environment plays a regional context.

Of greatest practical interest is the industrial greening and greening of the enterprise, which are in a dynamic relationship and represent the macro and micro levels of the modern economic system [7]. In more detail, the authors would like to consider the theoretical foundations of the greening process in the tourism sector both in the industry as a whole and at the micro level (table 1).

Table 1 The main directions of geo-ecological tourism

Directions of greening tourism	Macro level	Micro level
Formation and implementation state greening strategies economics	Strategy formation and priority areas greening tourism	Implementation of projects on greening tourism
	Formation development strategies eco-tourism	Development and implementation of programs eco-tourism
Implementation resource saving	State support, stimulation and promotion resource-saving technologies in the tourism business	Acquisition and implementation resource saving technologies on enterprises in the field of tourism
Greening the transport system	Systemic industry transition to environmentally friendly transport in the tourism sector	Acquisition and entry into Operation environmentally friendly transport on enterprises in the field of tourism
Greening the disposal of domestic and industrial waste	State support, stimulation and promotion of modern technologies for the processing and disposal of garbage in tourism business	Acquisition and implementation of modern technologies for the processing and disposal of garbage in enterprises in the field of tourism
Greening the social sphere	Development of a strategy and standards for environmental education in tourism	Development of exemplary basic educational programs and teaching materials in the field of environmental education in tourism
Balanced systemic environmental policy of the state, quality management of greening the economy	Modeling of national environmental policy in the context of tourism development	Implementation of a greening quality management system in tourism enterprises

Both in domestic literature and in foreign sources, various approaches to the interpretation of the concept of "geo-ecologization" are presented. At the same time, analyzing the definitions of this socio-economic category in the field of tourism, we can say that the geo-ecologization of tourism is a long-term, phased process of introducing environmentally friendly and safe forms of technological support for the provision of tourist

services both on the basis of innovative technologies and products, as well as taking into account cultural, historical and other traditions.

The goal of geo-ecological tourism is to minimize the impact of tourism market entities on the environment, taking into account the need to ensure sustainable economic growth and maximize consumer satisfaction.

The main tasks of geo-ecological tourism, as part of the process of greening the economy, include:

1. Geo-ecologization of tourism should contribute to a person's desire for a healthy and productive life both for himself and for society;

2. Geo-ecological tourism should make a significant contribution to the process of protecting, preserving and increasing the natural wealth of a particular region or territory;

3. At the enterprises of the tourism sector, when rendering services to the consumer, environmentally friendly products should be used;

4. The geo-ecologization of tourism serves the active dissemination of the ideas of sustainable economic development, including in the context of developing countries, in many of which tourism is a key sector of the national economic system;

5. Environmental protection should become an integral part of the modern tourism industry;

6. Tourist-recreational design and planning of zoning of territories should be carried out only through active participation and the formation of a single position of the local community of the territory;

7. Geo-ecologization of tourism should help preserve the ethnocultural potential of the territory, traditions, rites and beliefs of the local population.

The following directions of tourism geo-ecologization, based on the characteristic features and specifics of their implementation in the tourism business, can be combined systematized in more detail revealing the forms of their implementation (table 2).

Table 2. Directions of greening tourism and forms of their implementation

The name of the direction of tourism greening	Forms of implementation
Resource-saving technologies in the tourism business	<ul style="list-style-type: none"> - the use of telecommunication surveillance networks in the territory of a tourist site; -automatic regulation of the supply of lighting (for example, in the room stock, taking into account the presence of visitors); -automatic regulation of heat supply taking into account the seasonality factor; - taking into account changes in the quality and composition of air during the development of ventilation systems; -Reducing the outflow of thermal energy by increasing the standards of insulation of the premises; -use of a solar system; -use of the latest water treatment technologies; -use of energy-saving indoor lamps, etc.
Modern technologies for processing and recycling garbage in the tourism business	<ul style="list-style-type: none"> -creation of mini-enterprises for the processing of household waste; -segregation of garbage into categories; -use of modern forms of waste disposal
Greening transport support in tourism	<ul style="list-style-type: none"> -use of the latest vehicles to organize the movement of tourist flows; -use of environmentally friendly fuels; -use of alternative types of vehicles (cycling, etc.); -improving the role and forms of organization of hiking

As can be seen from the above data, most forms of tourism greening are concentrated in the hospitality industry, as well as in the field of transport support for tourism activities.

Special attention is given to environmental education, which is closely related to the functioning of the market under study, however, it is realized through the active participation of educational institutions, taking into account the norms and requirements of the professional community of the tourist community. [14]

Discussion. Based on the analysis of the localization of geo-ecology in the system of modern universal scientific thought, the authors generalized the main directions of the interaction of economics, geology and ecology in the socio-economic context of the development of modern society, which include the solution of the environmental problems of mankind, the preservation of non-renewable natural resources, and the preservation of the natural environment and ecosystems, the formation of an effective geo-environmental policy, the greening of the economy, the development of a green economy.

Conclusion. The mutual influence of the state of the environment and the functioning of the tourism sector on the basis of a generalized analysis of the level of interaction of the tourism industry and the state of the environment, as well as an analysis of the impact of the tourism industry on the environment in tourist destinations, are determined.

The authors formulated the concept of geoeologization of tourism - this is a long-term, step-by-step process of introducing environmentally friendly and safe forms of technological support for the provision of tourist services based on innovative technologies and products, as well as cultural, historical and other traditions.

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ТУРИЗМДІ ГЕОЭКОЛОГИЯЛАНДЫРУ – ТУРИСТІК АЙМАҚТАРДЫҢ ТҰРАҚТЫ ДАМУ ФАКТОРЫ РЕТІНДЕ

Аннотация: мақалада туризмді геоэкологияландыру (білім, геоэкологияны ғылым ретінде түсіну) туристік аймақтың тұрақты дамуының факторы ретінде қарастырылады. «Геоэкология» ұғымының анықтамалары салыстырылады. Геоэкологияның объектісі мен пәнін бөлудің тәсілдері ұсынылады. Геоэкологияның зерттеу объектісі – қоршаған орта – туризмнің дамуына тікелей немесе жанама әсер ететін табиғи және техногендік заттардың, денелердің, жағдайлардың, факторлардың өзара әрекеттесуі. Геоэкологиялық зерттеудің пәні ретінде геоэкологиялық процестер қарастырылады (адамдардың денсаулығы мен тіршілік әрекетінің өзгеруі, өсімдіктердің және жануарлар организмдерінің қоршаған ортаның тікелей немесе жанама әсерлері жағдайының өзгеруі). Геоэкологиялық туризм тұжырымдамасының анықтамасы тұжырымдалған. Геоэкологиялық туризмнің мақсаты, міндеттері және оларды жүзеге асыру нысандары айқындалады. Геоэкологиялық саясат пен геоэкологиялық білім берудің нормалары мен талаптарын үйлестіру арқылы геоэкологиялық туризмнің даму перспективалары көрсетілген.

Түйін сөздер: туристік қызметтің геоэкологиясы, геоэкология, туризм, туристік әлеует, туристік аймақтардың тұрақты дамуы, табиғи ресурстар, геоэкологиялық саясат.

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ГЕО-ЭКОЛОГИЗАЦИЯ ТУРИЗМА КАК ФАКТОР УСТОЙЧИВОГО РАЗВИТИЯ ТУРИСТСКИХ РЕГИОНОВ

Аннотация: в статье рассматривается геоэкологизация (знание, понимание геоэкологии как науки) туризма как фактор устойчивого развития туристского региона. Сравняются определения понятия «геоэкология». Предложены подходы к выделению объекта и предмета геоэкологии. Объектом геоэкологических исследований является окружающая среда – совокупность взаимодействующих природных и техногенных веществ, тел, условий, факторов, прямо или косвенно влияющих на развитие туризма. В качестве предмета геоэкологических исследований рассматриваются геоэкологические процессы (изменение здоровья и жизнедеятельности людей, изменение состояния растительных и животных организмов под прямым или косвенным воздействием окружающей среды). Сформулировано определение понятия геоэкологического туризма. Определены цель, задачи геоэкологического туризма и формы их реализации. Обозначены перспективы развития геоэкологического туризма через гармонизацию норм и требований геоэкологической политики и геоэкологического образования.

Ключевые слова: геоэкология, геоэкологизация туристской деятельности, окружающая среда, туристский потенциал, устойчивого развития туристских регионов, природные ресурсы, геоэкологическая политика.

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