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CONSTRUCTIVE-GEOGRAPHIC FOUNDATIONS OF NATURE MANAGEMENT ON THE NORTH-WESTERN COAST OF THE BLACK SEA

Д. О. Панкратенкова. КОНСТРУКТИВНО-ГЕОГРАФІЧНІ ОСНОВИ УПРАВЛІННЯ ПРИРОДОКОРИСТУВАННЯМ НА УЗБЕРЕЖЖІ ПІВНІЧНО-ЗАХІДНОЇ ЧАСТИНИ ЧОРНОГО МОРЯ. Статтю присвячено проблемі управління природокористуванням на узбережжі північно-західній частині Чорного моря, що виникла на основі нераціонального використання природних ресурсів. Розглянуто види антропогенного впливу і господарської діяльності (зростання населення в прибережних районах, урбанізація, забруднення вод акваторії, рекреація, рибальство, будівництво берегозахисних, портових, гідротехнічних та інших видів споруд, промисловість, сільське господарство і т.д.), що призводять до розвитку деструктивних процесів та деградації морських берегів.

На основі аналізу існуючої законодавчої системи управління в Україні, розкрито основні причини хаотичного освоєння морського узбережжя Чорного моря. Проаналізовано діяльність прийнятої всесвітньою громадськістю та ООН концепції «Комплексного управління береговою зоною» (КУБЗ) в різних країнах світу. Головною метою концепції є розробка проектів природокористування на узбережжях, що забезпечують оптимальний баланс між природними системами та соціально-економічним розвитком. Висвітлено цілі, засади та принципи впровадження КУБЗ в Україні, яке передбачає тісну взаємодію наукової, соціально-економічної та законодавчої сфер. Встановлено, що для розробки будь-яких проектів в береговій зоні моря, необхідно мати наукове природне обґрунтування.

Розроблені та вдосконалені конструктивно-географічні основи управління природокористуванням є універсальними й мають важливе значення для гармонізації взаємовідносин між людством і природою, шляхом зниження антропогенних навантажень не тільки в межах берегової зони північно-західної частини Чорного моря, але й Причорноморських країн і всього Світового океану в цілому. Викладені положення можуть стати основою законодавчих природоохоронних проектів.

Ключові слова: природокористування, антропогенний вплив, принципи, комплексне управління береговою зоною (КУБЗ), берегова зона, північно-західна частина, Чорне море, Україна.

Д. О. Панкратенкова. КОНСТРУКТИВНО-ГЕОГРАФИЧЕСКИЕ ОСНОВЫ УПРАВЛЕНИЯ ПРИРОДОПОЛЬЗОВАНИЕМ НА ПОБЕРЕЖЬЕ СЕВЕРО-ЗАПАДНОЙ ЧАСТИ ЧЕРНОГО МОРЯ. Статья посвящена проблеме управления природопользованием на побережье северо-западной части Черного моря, возникшей на почве нерационального использования природных ресурсов. Рассмотрены основные виды антропогенного влияния и хозяйственной деятельности (рост населения в прибрежных районах, урбанизация, загрязнение вод акватории, рекреация, рыболовство, строительство берегозащитных, портовых, гидротехнических и других видов сооружений, промышленность, сельское хозяйство и т.д.), что приводят к развитию деструктивных процессов и деградации морских берегов.

На основе анализа существующей законодательной системы управления в Украине, раскрыты основные причины хаотического освоения морского побережья Черного моря. Проанализировано деятельность принятой всемирной общест-венностью и ООН концепции «Комплексного управления береговой зоной» (КУБЗ) в разных странах мира. Главной целью концепции является разработка проектов природопользования на побережьях, обеспечивающих оптимальный баланс между природными системами и социально-экономическим развитием. Высветлено цели, основы и принципы внедрения КУБЗ в Украине, которое предусматривает тесное взаимодействие научной, социально-экономической и законодательной сфер. Установлено, что для разработки любых проектов в береговой зоне моря, необходимо иметь научное природное обоснование.

Разработанные и усовершенствованные конструктивно-географические основы управления природопользованием являются универсальными и имеют важное значение для гармонизации взаимоотношений между человечеством и природой, путем снижения антропогенных нагрузок не только в пределах береговой зоны северо-западной части Черного моря, но и Причерноморских стран и всего Мирового океана в целом. Изложенные положения могут стать основой законодательных природоохранных проектов.

Ключевые слова: природопользование, антропогенное влияние, принципы, комплексное управление береговой зоной (КУБЗ), береговая зона, северо-западная часть, Черное море, Украина.

Formulation of the problem. The problem of rational nature management and the protection of the coastal zone of the north-western part of the Black Sea, and the entire World Ocean attracted scientific interest in the middle of the twentieth century. Sea coasts have become the center of gravity for the population of the Earth, and as a result, the basis for the development of high socio-economic infrastructure. The intensive development of the coastal zone of the sea (CZS) and consumer economic activity have led to the development of destructive processes and degradation of natural systems [25,

34]. Solving this problem requires new scientifically based knowledge, new political approaches, public awareness, and most importantly, the development of integrated coastal zone management (ICZM). The concept of integrated coastal management appeared back in the 1980s of the last century, but was recognized in 1992 in Rio de Janeiro at the UN Conference (Agenda 21). The main goal of the concept is to preserve the natural resources of the coastal zone for the future generations, without upsetting the natural balance, but at the same time receiving economic benefits [28, 29].

Solution to the problem of rational nature management at the seashore of the study area is possible only with qualified development and implementation of ICZM. In order to achieve harmony in the natural-anthropogenic system, «coastal zone of the sea man», close interaction of the scientific and legislative spheres is necessary (Fig. 4). Scientific information should comprehensively take into account physiographic and socio-economic processes, as well as the laws of their development that determine the current state and dynamics of changes in natural systems during their operation. In the study of sea coasts, the natural state of all its constituent elements, changes in the hydrometeorological regime, the many-year rise in the level of the oceans, the state of the coastal waters of the sea, just to mention a few. The information obtained can be used to address topical issues and develop a constructive-geographical framework for environmental management in the conditions of transcendental anthropogenic impact.

Analysis of recent research and publications.

Nowadays, the issue of anthropogenic influence on the environment as a whole, and on the coastal zone in particular, is so relevant that many scientists are studying this problem. The first studies on the shores of the north-western part of the Black Sea were focused on the study of morphodynamic processes with the aim of building shore, port, hydro-technical, recreational and other types of structures. Most publications on this topic belong to such famous Soviet geomorphologists and coastal scientists as: V. P. Zenkovich [15, 16], O. K. Leontyev [19], V. I. Lymarev [20], Yu. V. Artyukhin [3], N. A. Aybulatov [1], G. N. Aksent'ev [2], Yu. D. Shuisky [22-27], G. V. Vykhovanets [5, 25], and others.

Modern studies [5-6, 10-14, 17-18, 26-27 etc.] of the coastal zone in the Black Sea region are aimed at studying various risks on the sea coasts of natural and anthropogenic origin; on the development of scientific recommendations and principles; the introduction of ICZM in Ukraine; the improvement of the current legislative base of the state for the protection and renewal of natural resources. But unfortunately, such research in most cases is carried out at the initiative of altruistic scientists from different institutions, rather than the current legislative environmental authority of management.

Among the latest foreign publications worth highlighting are the findings of [28-38]. They are aimed at studying different types of socio-economic influence on the coastal zone of the World Ocean and its various parts; to search for ways of rational nature management and conservation of natural resources; to solve problems between the scientific and legislative spheres and to develop strategies for

effective integrated coastal zone management (ICZM).

Identification of previously unsolved parts of a common problem. Despite the significant number of publications related to the research topic, the information requires a detailed synthesis for the development and improvement of the structural and geographical foundations of environmental management in the coastal zone of the north-western part of the Black Sea. The materials of the work are of significant structural and geographical importance in the implementation of ICZM, for the development of legislative projects and regulatory documents for the optimal use of the natural resources of the Black Sea coast, as well as in the planning and spatial organization of the coastal zone.

The purpose of the study is to analyze the current state of the coastal zone of the north-western part of the Black Sea, under conditions of uncontrolled anthropogenic influence, as well as the current management system of the coastal zone of the sea, to develop and to improve the structural and geographical foundations of rational environmental management.

Providing basic research materials. Ukraine is a maritime state washed by the Black and Azov Seas. The coastal zone of the north-western part of the Black Sea, according to hydrographic zoning [8], is the area of the first survey, the site, stretching from the Danube Delta to the Bakal Spit in Karkinitzky Bay. According to the developed regionalization of V. P. Zenkovich [16] and improved by his student Yu. D. Shuisky [23], three coastal regions are distinguished in the passages of this territory: Danube, North-Western and Dnieper-Karkinitzskaya (Fig. 1).

The seacoast of this region is actively used in the socio-economic, transport, industrial, agricultural, recreational and other spheres of economic activity. CZS is under increasing pressure mainly due to population growth, urbanization, progressive development of infrastructure in combination with uncoordinated industrial, transport, recreational, coastal, fishing, agricultural and other activities [26]. Since this is important for the national economy, competition for its resources is growing, threatening to destroy the functional integrity of the natural system.

Unqualified intervention in CZS leads to destructive processes and degradation of natural systems. As a result, soil erosion, abrasion-landslide and landslide processes (Fig. 2), coastal waters, reduction of renewable resources, erosion of beaches and coasts (Fig. 3), destruction of the natural unique relief, loss of wetlands and loss of biodiversity, etc. [25, 26].

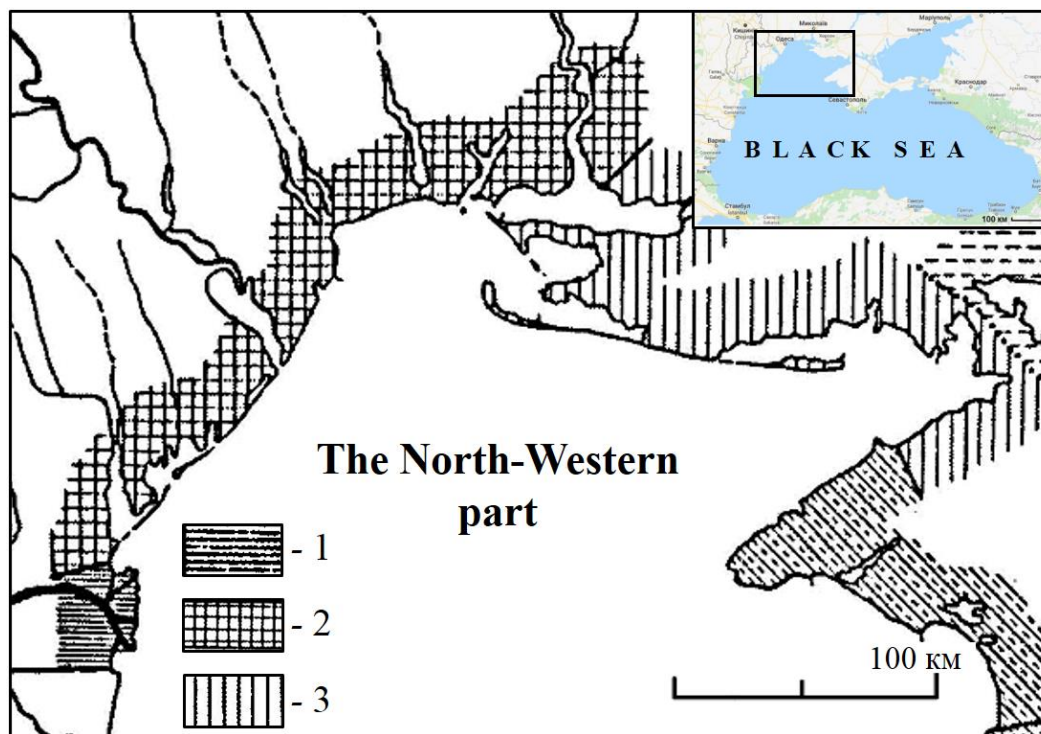


Fig. 1. The north-western part of the Black Sea within which the coastal areas are distinguished:
1 – Danube; 2 – North-Western; 3 – Dnieper-Karkinitskaya [16, 23]



Fig. 2. Landslide in southwest Odessa, village Sanzheika



Fig. 3. The coast washout on the outskirts of Chernomorsk

One of the reasons for the chaotic development of the coastal zone of the north-western part of the Black Sea is the fact that the interests of all legitimate users have not yet been recognized. Various administrations and enterprises pursue their «narrow» interests without a «big» connection with each other and do not discuss their plans for the future. However, to protect and preserve the coast, we need to do long-term integrated planning and recognize the legitimate interests of all users.

To solve this problem, most coastal countries in the world use integrated coastal zone management

(KUBZ). This concept implies a compromise and compliance with strict physiographic standards when making any interventions in the coastal zone. For example, the construction of an industrial complex or a port on the coast will be incompatible with the development of tourism, and may also destroy some particularly valuable natural systems. Effective implementation of the rules and environmental impact assessment are the tools for implementing KUBZ, which is a method for considering all the possible consequences associated with a given project or policy [28–38].

During the years of her independence, Ukraine also has attempts to introduce the ICZM of the Black and Azov Seas, but judging from the current state of the sea coasts, these were just attempts. The biggest catastrophes and financial losses occurred through the lack of awareness of citizens about the risks that CZS hides (Fig. 2, 3), as well as through the gap between scientific and legislative (political) areas of activity. Thus, there is an urgent need to apply integrated management of the Black Sea coast.

The objectives of the Black Sea coastal oil and sea sector are the main types of actions in all socio-economic areas on which effective management depends:

- ✓ To promote through rational planning of coastal sustainable development, by ensuring that the environment is taken into account in harmony with economic, social and cultural development;
- ✓ To preserve the nature of the coastal zone for present and future generations;
- ✓ To ensure sustainable use of natural resources, especially water;
- ✓ To ensure the preservation of the integrity of the coast, ecosystems, coastal landforms;
- ✓ To prevent and / or reduce the effects of natural disasters and, in particular, climate change, which may be caused by natural or human activities;
- ✓ To harmonize and strengthen the environmental legislation of Ukraine and improve its implementation, as well as to ensure compliance with all prescribed norms;
- ✓ To achieve coherence between public and private initiatives, as well as between all decisions of state bodies at the national, regional and local levels that affect the environmental management of the coastal zone;
- ✓ To create effective management and decision-making mechanisms for the sustainable development of the Black Sea coastal zone [33].

BZM management should cover the full cycle of collecting scientific geographic information, planning, decision-making, management and monitoring of implementation. The ICZM should use the informed participation and cooperation of all interested parties to assess the socio-economic goals in the coastal zone and take certain measures. ICZM should strive for a long-term perspective to balance the interaction of scientific, economic, social, cultural, recreational and other spheres of activity of the population within the legislative norms [32, 37].

The long-term success of ICZM depends on influence of those groups' support and individuals whose interests will be most affected by the implementation of the program. The participation of all major ICZM stakeholders, including the general public is necessary for the participation of all stake-

holders in the processes of program development and implementation [36].

In order to avoid the threat of the depletion of natural resources and disruption of the physical-geographical balance, it is necessary to develop scientific principles of rational nature management, a system of measures aimed at protecting, rational use and restoring natural resources, as well as maintaining natural balance. It is very important to organize the protection not only of individual components of the BZM, but also the preservation and possible recovery of the entire coast as a whole, the protective functions of which have significantly decreased due to intensive economic activity [23].

When implementing the ICZM in the north-western part of the Black Sea, the legislature can be guided by the following principles [9, 13, 27, 29, 31, 33]:

Principle 1. The coastal zone is a unique system of natural resources, it requires special approaches to management and planning.

Principle 2. The use of an integrated approach to management and planning of the coastal zone in the interaction of land and sea.

Principle 3. Adaptive management during the ICZM process, which will facilitate adjustments as problems and knowledge evolve. This implies the need for a reliable scientific basis for the evolution of the coastal zone.

Principle 4. The main task in the management of natural resources of the coastal zone is to preserve the total public and private material resources.

Principle 5. Development of land use strategies, plans and programs covering urbanization and various types of socio-economic activities of mankind, as well as other policy actions necessary for a successful ICZM.

Principle 6. Support and participation of relevant administrative bodies at the national, regional and local levels, between which relevant links should be established or maintained in order to improve the coordination of the various existing policies.

Principle 7. The preservation of the sustainable use of natural resources is one of the main objectives of coastal zone management.

Principle 8. Preliminary assessments should be conducted taking into account the risks of natural and anthropogenic origin in order to prevent and reduce their negative impact on the coastal zone.

Principle 9. An approach to environmental impact assessment is important for the effective management of coastal areas.

Principle 10. The organization of environmental systems in the coastal zone, which play the role of a kind of frame and allow you to preserve the most valuable natural complexes in their natural

state.

Despite the wide range of scientific information in the coastal areas, unfortunately, there is no connection between science and politics. Thus, there are problems that prevent bridging the gap between the scientific and legislative spheres: 1) unsatisfactory participation of scientists in the management of coastal zone; 2) lack of reliable information and data for management planning initiatives; 3) difficulties associated with the communication of scientific findings and their applicability for decision-making.

Despite some interest in the legislative bodies to scientific and technical approach of solving problems of coastal areas, the integration of results into coastal zone management plans is not guaranteed since decisions are often made with a downward approach and without the participation of scientists from different organizations. For effective use of the Black Sea ICZM in Ukraine, taking into account anthropogenic influence, there must be a coordinated relationship between the scientific and legislative sphere (Fig. 4).

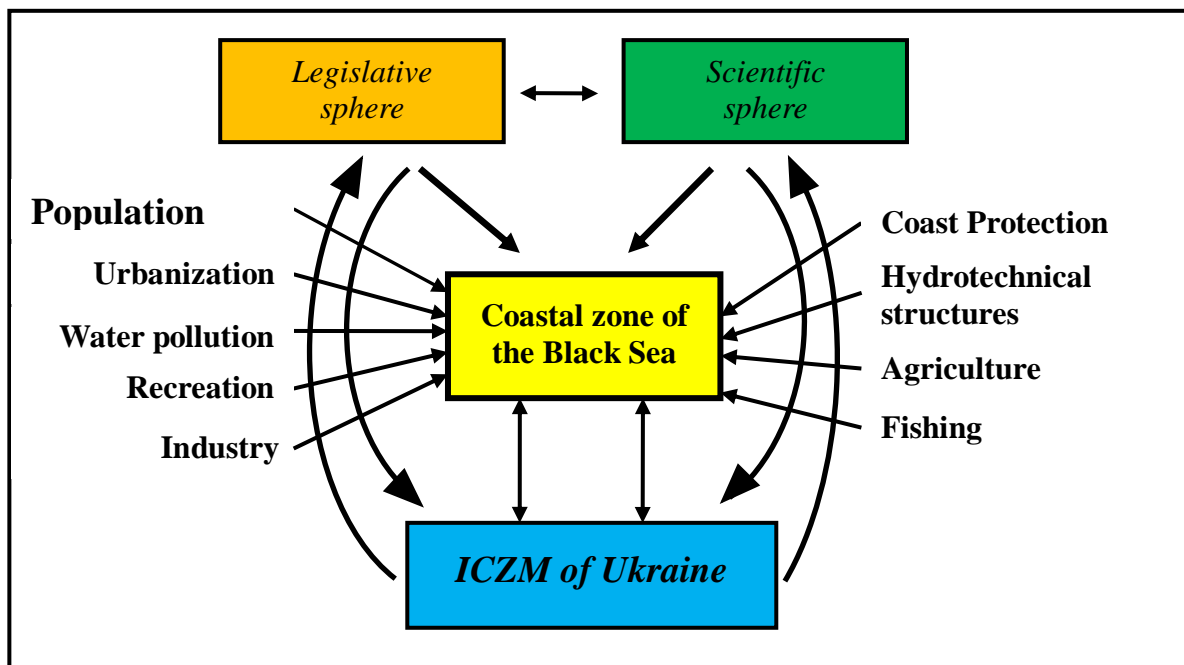


Fig. 4. Optimized scheme of integrated coastal zone management in the north-western part of the Black Sea [29]

It should be noted that the preservation of the natural resources and biodiversity of the coastline is more often constrained by political uncertainty and bureaucratic inertia than by lack of scientific information. This situation can only improve when the government begins to realize the importance of the resources in the coastal zone of the Black Sea.

Conclusions. The current state of the coastal zone of the Black Sea within Ukraine is under strong anthropogenic pressure. Vigorous economic activity (urbanization, recreation, agriculture, industry, fishing, construction of infrastructure, shore protection, hydrotechnical and other types of facilities) and, as a result, chaotic bank management have led to the development of destructive processes and degradation of the coastal zone of the Black Sea.

The seaboard of the north-western part of the Black Sea is one of the most important unique natural resources requiring the use of integrated coastal zone management (ICZM). This approach should provide a basis for the implementation of measures

that are necessary to preserve the most important coastal natural systems for the present and the future generations.

It is necessary to establish a system of relations between the scientific and legislative sphere at ICZM. Any distribution rights to use coastal resources should be based on a scientific nature study with the assistance of all levels of government.

When developing projects for planning and carrying out of any kind of actions in the coastal zone of the Black Sea, one should take into account the historically established structure of the relationship between physiographic elements (coast, submerged slope, aeolian ridges, hydrometeorological conditions, vegetation, condition of coastal waters), including the processes and mechanisms of development of this natural system.

Developed and improved structural and geographical foundations of environmental management are universal and are important for harmonizing the relationship between humanity and nature,

by reducing anthropogenic pressures not only within the coastal zone of the north-western part of the Black Sea, but also in the Black Sea countries and

the World Ocean as a whole. These provisions can be the basis of legislative environmental projects.

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CONSTRUCTIVE-GEOGRAPHIC FOUNDATIONS OF NATURE MANAGEMENT ON THE NORTH-WESTERN COAST OF THE BLACK SEA

The aim of the research is to analyze the problem of anthropogenic influence on the sea coasts, to develop and improve the constructive-geographical foundations of rational nature management for the conservation and possible renewal of natural resources on the north-west coast of the Black Sea.

Methods. The main methods used in the preparation process and writing of the article are systematization methods, retrospective, analytical, comparative geographical and historical.

Scientific novelty of the article. The fact that the coastal zone of the Black Sea coast is experiencing uncontrolled anthropogenic impacts; this research has improved and developed constructive-geographical foundations for their rational management.

Practical value. Developed scientific recommendations are universal. They are very important for the implementation of integrated management of the coastal zone in the country, the optimization of nature management and the preservation of the natural systems on the north-west coast of the Black Sea, in particular, and the entire World Ocean, as a whole.

Research results. Intensive development of the coast and consumer economic activity over the past decades has led to the degradation of natural systems. Rational use of natural resources of the coastal zone of the sea assumed the development of foundations that comprehensively take into account the physical-geographical and socio-economic processes, as well as the laws of their development that determine the current state and dynamics of changes in natural systems during their operation. On the basis of a detailed study

of domestic and foreign publications related to this topic, the activities of integrated coastal zone management (ICZM) in different countries of the world were analyzed. The foundations and principles for introducing ICZM in Ukraine are highlighted. It has been established that for the development of any projects in the coastal zone of the sea, it is necessary to have a scientific natural rationale from scientists obtained in the process of detailed research. These provisions can be the scientific basis of the relevant legislative framework for the optimization of nature management and spatial planning on the north-west coast of the Black Sea.

Well-developed and improved scientific provisions are suitable for correcting the current situation in the direction of higher efficiency on coastal control. These constructive-geographic foundations can become the basis and the main algorithm for practical implementation of environmental legislation in Ukraine.

Keywords: nature management, principles, anthropogenic influence, integrated coastal zone management (ICZM), coastal zone, north-west, Black Sea, Ukraine.

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