Анотація. Куяльницький лиман, який є унікальним водогосподарським об’єктом з ресурсами, що за своїми бальнеологічними властивостями наблизяться до еталонних, потребує допомоги в аспекті забезпечення збереження, запобігання деградації та сталого розвитку як екосистеми, що включає економічну, інфраструктурну, соціальну, рекреаційно-туристичну складові. Територіальні громади, які розташовані в басейні Куяльницького лиману, повинні бути залучені до вирішення спільних задач щодо збереження та ефективного використання його ресурсів в процесі суспільного виробництва та забезпечення повоєнного відновлення. Оскільки природно-лікувальні властивості лиману обумовлюють його роль як рекреаційно-реабілітаційний об’єкт національного та міжнародного масштабів, потрібними є організаційно-економічні, адміністративні, інформаційні та інші заходи щодо збереження лиману та забезпечення для громад в басейні лиману належного високого рівня добробуту. Куяльницький лиман є одним з прикладів територіально-господарської системи, в якій наявні численні природно-господарські ресурси та активи, на приклад мікрорегіону Куяльницького лиману. Завданнями дослідження є визначення особливостей розвитку природно-господарської екосистеми Куяльницького лиману, вибір інструментів організаційно-економічного забезпечення сталого розвитку та підвищення згуртованості територіальних громад.
відтворення стільких природно-господарських активів. Економічно-організаційне обґрунтування реалізації проектів поповнення лиману прісною водою на основі її оцищального використання, рецикліву та регулювання рівня солоністю з метою збереження належного стану бальнеологічних ресурсів і отримання додаткових цінних продуктів.

Матеріали і методи. Матеріали представлені результатами повернення досліджень та моніторинговими даними в сфері розв'язання ключових проблем збереження та забезпечення розвитку Кужляницького лиману, що дозволяють краще зрозуміти комплексний розвиток територіальних громад з прив'язкою до унікальних природно-господарських об'єктів.

Виокремлені методи системного аналізу, статистичного аналізу, методи порівняльних та узагальнюючих, методи визначення закономірностей розвитку об'єктів та явищ в сфері визначення ефективних варіантів залучення до процесів суспільного виробництва природних об'єктів на основі забезпечення їхнього збереження та сталого розвитку.

Результати. На основі аналізу динаміки показників стану Кужляницького лиману, а також на основі вивчення досвіду дослідження даного природно-господарського об'єкту сформульовано перелік із семи ключових задач, які належать вирішити для збереження, відновлення бальнеологічних ресурсів лиману та забезпечення його сталого розвитку, а саме: підтримка необхідного рівня води; підтримка рівня солоністі; організація ефективної системи управління процесами економічного, соціального, екологічного розвитку лиману на основі формування спільного органу управління в басейні Кужляницького лиману на основі взаємодії територіальних громад та Національного парку «Кужляницький»; організація виробництва, орієнтованих на збалансування вмісту корисних ресурсів в Кужляницькому лимані та на максимально ефективне їх використання з отриманням підвищеної доданої вартості; підтримка водного комплексу в складі екосистеми Кужляницького лиману; створення екологічного центру в басейні лиману; підтримка підприємницької активності та підвищення рівня збереження в громаді басейну лиману із засвоєнням інструментів регіонального розвитку; підвищення рівня обізнаності в масштабах країни та за кордоном про унікальність Кужляницького лиману як природного рекреаційно-господарського об'єкту та отримання можливостей щодо залучення необхідних обсягів фінансування для збереження, відновлення та розвитку природного активу національного та міжнародного значення.

Запропоновано організувати солепромисел із застосуванням розробок Кужляницького лиману як захід підтримки необхідного рівня його солоністі та участі в забезпеченні національної продовольчої безпеки. Сформульовано інституційні засади застосування компенсаційного механізму відкладання збитків від порушення екологічного стану річок басейну Кужляницького лиману. Запропоновано комплексне рішення задачі забезпечення сталого розвитку та підвищення рівня економічної, соціальної здатності громад басейну Кужляницького лиману за допомогою формування екологічного центру в басейні лиману, а також впровадження комплексних рішень та підвищення рівня збереження в громаді басейну лиману з урахуванням і освоєнням інструментів регіонального розвитку та забезпечення сталого розвитку, а саме: підтримка необхідного рівня води; підтримка рівня солоністі; організація ефективної співпраці та взаємодії громад та Національного парку «Кужляницький». Використані методи системного аналізу, статистичного аналізу, методи порівнянь, узагальнюючих методи, методи визначення закономірностей розвитку об'єктів та явищ в сфері визначення ефективних варіантів залучення до процесів суспільного виробництва природних об'єктів на основі забезпечення їхнього збереження та сталого розвитку.

Запропоновано комплексне рішення задачі забезпечення сталого розвитку та співробітництва громад з природним ефективним використання природно-господарського активу на основі використання інструментів державного регіонального розвитку, зокрема: співробітництва громад, утворення спільних органів управління ресурсами, створення інтеграційних структур у взаємодії екологічних парків, екологічних територій-господарських систем, засвоєння інструментів розвитку природних об'єктів.

Висновки. Запропоновано комплексне рішення задачі збереження сталого розвитку та співробітництва громад з природним ефективним використання природно-господарського активу на основі використання інструментів державного регіонального розвитку, зокрема: співробітництва громад, утворення спільних органів управління ресурсами, створення інтеграційних структур у взаємодії екологічних парків, екологічних територій-господарських систем, засвоєння інструментів розвитку природних об'єктів.

Ключові слова: організаційно-економічні інструменти регіонального розвитку, Кужляницький лиман, співробітництво громад, екологічна територія, екосистема, збереження природних ресурсів.

LAIKO O.I.
Dr. Sc. (Economics), Prof., Vice-director for scientific work of a State Organization «Institute of market and economic&ecological researches of the National Academy of Sciences of Ukraine» Frantsuvskyi Boulevard, 29, Odessa, Ukraine, 65044
E-mail: alexlayko@gmail.com
ORCID: 0000-0001-7082-0862

BOHUSHEVYCH V.K.
Research fellow of Regional Economic Systems Development Department
ORGANIZATIONAL AND ECONOMIC PRINCIPLES OF CONSERVATION AND ENSURING SUSTAINABLE DEVELOPMENT OF THE KUIALNYK ESTUARY

**Topicality.** The Kuialnyk estuary, which is a unique water-management object with resources that, in terms of their balneological properties, are close to reference ones, needs help in the aspect of ensuring preservation, prevention of degradation and sustainable development as an ecosystem, which includes economic, infrastructural, social, recreational and touristic components. Territorial communities located in the basin of the Kuialnyk estuary should be involved in solving common problems regarding the preservation and effective use of its resources in the process of social production and ensuring post-war recovery. Since the natural and healing properties of the estuary determine its role as a recreational and rehabilitation object of national and international scale, organizational, economic, administrative, informational and other measures are needed to preserve the estuary and provide the communities in the estuary basin with an appropriate high level of well-being. The Kuialnyk estuary is one of the examples of a territorial economic system in which numerous natural resources are available, but the infrastructure is undeveloped, there are no conditions for ensuring the development of entrepreneurship among community residents, and other economic, social, and ecological needs of the population are not met. The role of such objects in the context of ensuring post-war recovery and the transition to a model of sustainable development is extremely high, since, with the help of well-chosen measures of state regional policy and local organizational and economic mechanisms, they can be transformed into points of economic growth, cooperation and cohesion of territorial communities.

**Aim and tasks.** The purpose of the study is to determine the organizational and economic principles and current tools of state regional policy aimed at ensuring the sustainable development of territorial communities located in the area of common natural, economic resources and assets, using the example of the Kuialnyk estuary microregion. The tasks of the research are to determine the features of the development of the natural and economic ecosystem of the Kuialnyk estuary. The choice of tools for organizational and economic support of sustainable development and increasing community cohesion in the context of preservation and reproduction of common natural and economic assets. Economic and organizational justification for the implementation of projects to replenish the estuary with fresh water based on its economical use and recycling, regulation of the salinity level in order to preserve the proper state of balneological resources and obtain additional valuable products.

**Materials and methods.** The research materials are represented by the results of previous studies and monitoring data in the field of solving key problems of preserving and ensuring the development of the Kuialnyk estuary, data from the State Agency of Water Resources of Ukraine, materials representing the best practices of integrated development of territorial communities with reference to unique natural and economic conditions objects. Scope of scientific methods are used, namely: methods of system analysis, statistical analysis, methods of comparisons and generalizations, methods of determining patterns of development of objects and phenomena in the field of determining effective options for involvement in the processes of social production of natural objects on the basis of ensuring their preservation and sustainable development.

**Research results.** Based on the analysis of the dynamics of the indicators of the state of the Kuialnyk estuary, as well as on the basis of the study of the research experience of this natural and economic object, it is proposed a list of seven key tasks that are to be solved to preserve and restore the balneological resources of the estuary and ensure its...
sustainable development was formulated, namely: sustentation of required water level; salinity level maintenance; organization of an effective management system for the processes of economic, social, and ecological development of the estuary based on the formation of a joint management body in the Kuialnyk estuary basin based on the interaction of the territorial communities of the estuary basin and the Kuialnytskyi National Park; the organization of productions aimed at balancing the content of useful resources in the Kuialnyk estuary and at their maximum effective use with obtaining increased added value; restoration of small rivers as part of the Kuialnytskyi estuary ecosystem; creation of an eco-industrial (eco-recreational) park in the estuary basin; supporting entrepreneurial activity and increasing the level of cohesion in the communities of the estuary basin with the use of regional development tools; raising the level of awareness in the country and abroad about the uniqueness of the Kuialnytskyi estuary as a natural recreational and economic object and obtaining opportunities to attract the necessary amounts of funding for the preservation, restoration and development of a natural asset of national and international importance.

It is proposed to organize a salt mining using brine from the Kuialnyk estuary as a measure to maintain the proper level of its salinity and participate in ensuring national food security. The institutional principles of the application of the compensatory mechanism for compensation for damage caused by the violation of the ecological condition of the rivers of the Kuialnyk estuary basin are formulated. A comprehensive solution to the task of ensuring sustainable development and increasing the level of economic and social cohesion of the communities of the Kuialnyk estuary basin is proposed through the formation of an eco-industrial park on the territory of the Odesa city community's filtration fields, due to which the Kuialnyk and Khadzhibey estuaries will be filled with the purified waters of the reconstructed biological treatment station. The implementation of such an approach is a solution that meets the goals of sustainable development and secondary use of water resources based on the selection and disposal of pollutants, their transformation into fertilizers and other useful products with high added value.

Conclusions. A comprehensive solution to the problems of ensuring sustainable development and community cooperation regarding the joint effective use of natural and economic assets based on the use of state regional development tools is proposed, in particular: community cooperation, the formation of joint resource management bodies, the creation of integration structures in the form of eco-industrial parks, eco-recreational territorial and economic systems, the application of organizational and economic compensation mechanisms to ensure financing of activities related to the preservation and restoration of natural resources, the stimulation of socially effective entrepreneurial activity and participation in the implementation of the Plan for the post-war recovery of Ukraine by transforming depressed areas neighboring to the Kuialnyk estuary into functional zones - points of economic growth and socio-economic cohesion.

Keywords: organizational and economic tools of regional development, Kuialnyk estuary, community cooperation, eco-industrial parks, eco-recreational park, cohesion

Problem statement and its connection with important scientific and practical tasks. The Kuialnyk estuary, which is a unique natural object with extremely valuable medical resources, represents a potential pole of socio-economic development, the cohesion of communities and population, business entities, but its potential has not been used. The current state of the Kuialnyk estuary is characterized by the presence of numerous problems with its water level, excessive mineralization, violation of the natural ways of filling the estuary, caused by irrational approaches to the use of its resources, the waters of the rivers that feed the estuary, the neglect of infrastructure facilities and economic activities, which directly or indirectly have a negative impact on the ecosystem of the estuary (Burkynskyi et.al., 2019). In order to preserve the estuary as a valuable water management and balneological object of national and international scope, to ensure the sustainable development of its ecosystem, it is necessary to apply a system of organizational and economic tools, measures and mechanisms of regional development capable of increasing the efficiency of the use of the territory's resources in public production and in the process of post-war reconstruction countries. It is also necessary to develop an effective management system for the sustainable development of the estuary basin based on the involvement of the administrations of territorial communities and the Kuyalnitskyi National Park in the processes of cooperation. The potential of the communities of the basin of the Kuialnyk estuary allows to ensure a sufficiently high level of economic development in the sphere of recreation, treatment and rehabilitation, as well as in many other spheres that are auxiliary and form the infrastructural environment. The effective involvement of the resources of territorial communities in the processes of post-war reconstruction on the basis of sustainable development and increasing the level of cohesion corresponds to the goals and objectives of the State Strategy for Regional Development until 2027 (SRDS of Ukraine for 2021-2027, 2020) and the Recovery Plan of Ukraine (Ukraine Recovery Conference, 2022). Preservation and promotion of the restoration of the estuary, implementation of resource-saving technologies in the economic activity of communities adjacent to the estuary represent an approach to the implementation of sustainable development goals (UNDP in Ukraine,
and a system of measures to increase the level of cohesion in economic, ecological and other aspects.

Analysis of recent publications on the problem. The scientists of the Odesa State Ecological University (Rozenhurt, 1974), (Tuchkovenko & Hopchenko, E.D.) devoted their work to the problems of ensuring a good ecological condition of the Kuialnyk estuary, finding rational ways of its restoration and maintaining water and mineral balances. The State Institution "Ukrainian Research Institute of Medical Rehabilitation and Resort Therapy of the Ministry of Health of Ukraine" (Babov, et.al., 2019), the State Organization "Institute of Market and Economic&Ecological Research of the National Academy of Sciences of Ukraine" (Burkynskyi et. al., 2019), (Poliakova, 2012), (Rubel, 2013), Institute of Marine Biology of the National Academy of Sciences of Ukraine, Ukrainian scientific center of Ecology of Sea (UkrSCES) (Scientific research works on the hydrobiological survey of the state of the Kuialnyk estuary and sea water from the Odesa Bay, 2018). The reports on scientific research work mostly deal with separate issues of maintaining the good condition of the estuary and getting out of the ecological crisis caused by the blocking of the natural flow of the Velikiy Kuyalnik River. However, a comprehensive vision of options for solving the problems of the Kuialnykestuary in a broader aspect, from the standpoint of the spatial development of the entire natural and economic ecosystem, including the territorial communities located in the estuary basin, is not considered.

Allocation of previously unsolved parts of the general problem. Despite the large number of scientific studies and publications on the topic of ensuring the revival of the Kuialnyk estuary, the problem of the unsatisfactory ecological condition of the estuary basin remains an unsolved problem, as well as the task of substantiating the organizational and economic foundations of ensuring the sustainable development of the entire ecosystem of the Kuialnyk estuary together with the adjacent territorial areas. communities Separately from the issues of improving the ecological condition of the estuary, the aspects of restoring the resort and recreational infrastructure are considered, but they are directly dependent on the state of peloids and brine of the estuary, are interconnected with the issues of economic development of the surrounding communities, with the level of organization of entrepreneurial activity of the local population, which is significantly involved in economic activity directly or indirectly related to the use of resources and opportunities provided by the Kuialnykestuary. The question of the application of cooperation tools of territorial communities to solve joint tasks that concern the entire estuary basin remains unresolved, they can be solved on the basis of the application of various forms of integration of economic entities, such as, for example, eco-industrial, eco-recreational parks, etc. It is also necessary to improve the management system for the economic, social, and ecological development of the Kuialnyk estuary ecosystem, taking into account the role of the Kuialnytskyi National Park, as well as including other natural objects that may be related to the Kuialnyk estuary.

Formulation of research objectives (problem statement). Determination of the organizational and economic principles and relevant instruments of state regional policy, development of a mechanism of interaction of local administrations to ensure effective management and sustainable development of territorial communities, the factor of cohesion of which is the location in the area of finding common natural and economic resources and assets, the presence of established connections, common factors, factors, interests and problems that must be solved in the course of ensuring the livelihood of communities and the implementation of economic activities involving the processes of social production of common resources, on the example of the Kuialnyk estuary microregion.

The tasks of the research are to determine the features of the development of the natural and economic ecosystem of the Kuialnyk estuary. The choice of tools for organizational and economic support of sustainable development and increasing community cohesion in the context of preservation and reproduction of common natural and economic assets. Justification of possible options for creating integration territorial and economic systems in the form of community cooperation agreements, eco-industrial parks and other entities, whose activities will be aimed at solving existing ecological, economic and social problems related to the Kuyalnik estuary, and will also concern and other natural objects, in particular the Khadzhibey estuary, which also needs active measures to improve the condition and recovery after pollution, and the majority of such activities will be related to the improvement of infrastructure and other projects of socio-economic development of the Odesa, Krasnosilska, Ivanivska and Usativska communities (Interactive map of communities of Ukraine, 2020).

Materials and Methods. The research materials are presented by the results of previous
studies and monitoring data in the field of solving key problems of preserving and ensuring the development of the Kuialnyk estuary, data from the State Agency of Water Resources of Ukraine, materials representing the best practices of integrated development of territorial communities with reference to unique natural and economic conditions objects The conceptual and institutional basis of the study was formed with the help of official documents in the field of decentralization, local self-government, state regional policy, with an emphasis on normative support for cooperation and cohesion of territorial communities around issues of joint use of natural resources and economic assets, infrastructure facilities. The work uses methods of system analysis, statistical analysis, methods of comparisons and generalizations, methods of determining patterns of development of objects and phenomena in the field of determining effective options for involvement in the processes of social production of natural objects on the basis of ensuring their preservation and sustainable development.

**An outline of the main results and their justification.** The Kuialnykestuary, located in the northwestern part of the Ukrainian Black Sea coast, is a unique water body characterized by high balneological properties and belongs to closed estuaries. The mud (peloids) of the Kuialnyk estuary are not inferior in their properties to the healing resources of the Dead Sea and are approaching the reference indicators. The supply of healing brine, mineral water and mud on a national and global scale is invaluable, especially considering the growing need for healing and recovery facilities and places for the population of a country facing military aggression. Ensuring the sustainable development of the Kuialnykestuary as one of the examples of the implementation of a micro-regional project for the preservation and restoration of a natural, water management object and adjacent territorial communities meets the needs and tasks of the Recovery Plan of Ukraine (Ukraine Recovery Conference, 2022), in particular in the areas of: environmental safety, restoration and development infrastructure, recovery and development of the economy, health care and others.

In addition to the well-known problems with an excessively high level of salinity of the estuary, low water level and insufficient volumes of fresh water entering the estuary, there are also other significant threats to the ecosystem of the estuary in a broad sense, namely: low level of socio-economic development of nearby communities, outdated and dilapidated infrastructure medical institutions, the chaotic provision of services for the accommodation of tourists and guests who wish to use medical facilities, the presence of illegal structures that have disturbed and prevent the natural filling of the estuary with fresh water, the lack of financial and material resources in local communities, as well as the political will to take effective measures to restore the natural the system of the estuary and the improvement of the adjacent infrastructure, the absence of a management system of the estuary as a complete integrated natural, territorial-economic, recreational resource, around which territorial communities with significant differences in the levels of socio-economic development are located. Only the main problems are listed, but in fact there are many more of them and all of them must be solved in order to ensure the sustainable development of the Kuialnykestuary and the transformation of its resources into real assets that will ensure the participation of this object in social production and ensuring the well-being of nearby communities and the provision of medical services in national and international scales.

In order to preserve the Kuialnyk estuary as a unique object and ensure its sustainable development, the Law of Ukraine "On declaring the natural territory of the Kuialnyk estuary of Odesa region as a resort of state importance" was adopted in December 2018, as well as the Decree of the President of Ukraine, 2022, proclaimed creation of the "Kuialnytskyi" National Nature Park, the territory of which will cover the lands of the Odesa district of the Odesa region (Odesa, Krasnosilska, Ivanivska and Usatvska communities) and the Berezovyksy district of the Odesa region (Ivanivska community). However, due to the beginning of the war, it was unfortunately not possible to ensure the proper implementation of the Presidential Decree and to form a management structure, development plan, and mechanisms to ensure the effective functioning of the Kuialnytskyi National Park.

The implementation of the planned measures to preserve resources and restore the Kuialnyk estuary is foreseen, starting in 2020, by the regional program "Conservation and restoration of water resources in the Kuialnyk estuary basin for 2019-2023" especially adopted by the decision of the Odesa Regional Council No. 1095-VII dated 25.10.2019; also, unfortunately, is not carried out due to the lack of financial resources during the resistance to military aggression. This program envisages carrying out measures to restore the condition of the estuary, bring the quality indicators of its balneological resources to the
norm by preventing excessive mineralization and maintaining the water level of the estuary at a reasonably normal level. The implementation of systemic measures is proposed to be carried out on the basis of scientific research, search and justification of filling the Kuialnykestuary with fresh water from alternative sources.

Restoring the processes of formation of medical resources and ensuring the sustainable development of the ecosystem of the Kuialnyk estuary are considered possible in two main ways: natural (without interference in the processes of regeneration of microorganisms and peloidogenesis), artificial with minimal anthropogenic influence and stimulation of natural reproduction processes (based on the most frugal attitude to available resources and creation of conditions for restoration of natural processes of generation of medical resources). The natural way of restoring the properties and characteristics of the Kuialnykestuary is to some extent possible due to the natural resistance of the estuary to climate changes and some external influences. Thus, the multi-layered bottom sediments of the estuary have sufficiently large reserves of minerals and peloids, and temporary sharp fluctuations in the water salinity level, caused by rock-climatic processes, gradually smooth out and the salinity level returns to normal. Thus, the excessive desalination of water due to the increased amount of precipitation is fairly quickly compensated by the dissolution of minerals from the bottom layers, as well as due to the chemical transformations of substances that were in the composition of peloids in a bound form due to the excessive salinity of the estuary brine. The results of long-term observations and research (Burkynskyi et al., 2019) of the level of mineralization of the waters of the Kuialnyk estuary confirm the existence of a natural mechanism of self-regulation of brine salinity and indicate the presence of short and long (up to 20 years) cycles of salinity change. However, this mechanism of self-education works under the condition that the natural sources of replenishment of the estuary with fresh water are not disturbed and other essential processes of ensuring the vitality of the estuary ecosystem are not interfered with. Over the past decades, there have been significant transformations and interventions in the processes of functioning of various subsystems of Kuialnyk, and as a result, we believe that the natural ways of restoring the properties of the estuary are complicated and, in some cases, impossible to a sufficient extent. This is evidenced by disturbances in the natural cycles of long-term fluctuations in the salinity level of the estuary waters. Thus, intervention in the course of the Velikiy Kuyalnik river through the construction of unauthorized ponds, dams, and quarries led to a catastrophic decrease in the flow of the river into the estuary: instead of the proper 5-7 million m³, the volume of fresh water inflows barely reaches 1 m³ per year. (Adobovskiy & Bohatova, 2013), (Tuchkovenko, 2022), (The state of the natural environment in Odesa region, 2010). Therefore, we believe that it is risky to hope for self-regulation of the processes of mineralization of the estuary waters at this stage, given the threat of deterioration and loss of the existing properties of the estuary.

However, artificial intervention in the life processes of the Kuialnykestuary should not be excessive, it is worth correcting only those components and aspects that require attention, are characterized by a significant risk of deterioration or non-restoration of the proper state, and natural ways of normalizing the disturbed processes are impossible without external artificial help.

Speaking about the aspects of intervention in the ecosystem of the Kuialnykestuary, it is worth mentioning the experience of organizing salt mining from 1867 to 1934, when salt extraction was to a greater extent determined not by the need for salt itself, but by the expediency of regulating the salinity of the estuary and achieving better balneological indicators of brine and peloids, approaching to optimal (reference) values (Burkynskyi et.al., 2019), (Bohatova et al., 2017).

The current state of the Kuialnykestuary, the complexity of problems that arise in connection with an irrational policy or its complete absence in relation to the effective use of its resources, promotion of their restoration, a sharp deterioration of the ecological condition of the estuary, the low level of socio-economic development of the communities of the estuary basin, the lack of proper infrastructure, the presence of adjacent environmental, social, and economic problems related to the estuary - all this determines the need to apply a systemic approach to improving this situation. A broader and more comprehensive approach to solving the problems of the Kuialnykestuary and its surrounding areas is proposed, rather than the previous fragmentary measures that were taken to restore the main indicators of the functioning of the estuary ecosystem, to increase its water level, control salinity, in particular by adding sea water.

In order to comprehensively solve the problems of the Kuyalnytsk estuary, it is necessary to maximally involve the adjacent territorial communities of the estuary basin, namely: Odesa
city community, Krasnosiilska village community, Usativska village community, and in matters related to the restoration of the natural flow of the Velikiy Kuialnyk River - Ivanivsk settlement community.

In order to reflect a comprehensive approach to solving the problems of the Kuialnyk estuary, we suggest formulating the main practical sub-goals and tasks, the solution of which will ensure the achievement of the main goal - the systemic recovery and long-term viability of the estuary as a valuable natural-economic, healing asset, together with approaching the target values of indicators of sustainable development of territorial communities, located in the estuary basin. Such sub-goals are:

1) Ensuring the water level of the estuary that is suitable for life (from -7.0 m to -5.8 m according to BS) and regulated depending on the seasonality of the amount of inflow;

2) Ensuring the appropriate level of mineralization of the waters of the Kuialnyk estuary to preserve the medicinal properties of peloids, as well as for the flow of peloidogenesis processes and the life of microorganisms in the estuary;

3) Organization of an effective system of management and strategizing of the processes of economic, social, and ecological development of the estuary based on the formation of a joint management body in the basin of the Kuialnyk estuary, whose actions should take into account the peculiarities of the functioning of the Kuialnytskyi National Park;

4) Organization of productions aimed at balancing the content of useful resources in the Kuialnyk estuary and at their maximum effective use with increased added value;

5) Using the resources of other natural and infrastructural facilities to ensure the sustainable development of communities in the basin of the Kuialnyk estuary and other nearby communities based on the maximization of the received economic, social, and environmental benefits. In particular, the implementation of the project for the preservation and reproduction of the resources of the Kuialnyk estuary together with measures to maintain the good ecological condition of the Khadzhibey estuary and small rivers that are part of the ecosystem of the Kuialnyk estuary (in particular, the Velikiy Kuialnyk, Kubanka, Dovboka rivers);

6) Application of incentives to support business activities in the field of improving the infrastructural provision of resource availability of the Kuialnyk estuary;

7) Ensuring the participation of projects aimed at the restoration and development of ecosystems of the Kuialnyk estuary in international cooperation programs in order to obtain opportunities to attract the necessary amounts of funding for the preservation, restoration and development of a natural asset of national and international importance.

In order to ensure the implementation of the defined tasks of preservation and development of the Kuialnyk estuary, modern tools of the state regional policy must be applied, as it is necessary to combine the efforts of local communities, districts, authorities at the regional and national levels, as well as foreign partners.

Currently, due to the implementation of the decentralization reform in Ukraine, a significant number of tools for stimulating regional and local development are available to ensure the restoration and maintenance of the ecosystem of such a complex natural asset as the Kuialnyk estuary, together with the economic systems of territorial communities located in its basin. The task to be solved is somewhat complicated by the impact of the consequences of military aggression against Ukraine, as well as a shortage of financial and other resources, insufficient experience in the field of local self-government, and the need to exercise political will for the faithful implementation of certain administrative decisions, in particular those related to the elimination of illegal obstacle to the normal life activity of natural objects.

Considering the modern institutional basis in the field of ensuring the sustainable development of complex natural and spatial-economic systems, it is worth highlighting such normative acts, the application of which provisions will allow to really solve most of the problems of the Kuialnyk estuary. The general principles and possibilities of managing the development of the Kuialnyk estuary as a unique ecosystem, which is characterized by the commonality and integrity of existing and potential connections, common issues and interrelated tasks, and which requires improvement of the organizational-economic, administrative-management, financial levers of facilitating the transition to sustainable development are determined by the following basic normative documents: the Constitution of Ukraine, the Laws of Ukraine "On the Basics of State Regional Policy", "On Cooperation of Territorial Communities", "On Local Self-Government in Ukraine", "On Local State Administrations", "On Cross-Border Cooperation", "On the regulation of urban development activities", "On state target programs", "On state forecasting and development of programs of economic and social development
of Ukraine”, "On the General scheme of planning the territory of Ukraine” and other laws of Ukraine, acts of the President of Ukraine, the Cabinet of Ministers of Ukraine, as well as international treaties of Ukraine, consent to their bindingness has been granted by the Verkhovna Rada of Ukraine.

The basin of the Kuialnyk estuary with all territorial communities located in its area, which have certain interests in the development of this ecosystem, should be considered a complete object for the application of measures to support development by means of state regional policy. The determination of the status of the natural, territorial and economic ecosystem of the estuary as a complete object corresponds to the provisions of the current regulatory framework, in particular, the category of microregion, which, in accordance with Art. 1 of the Law "On the Basics of State Regional Policy", there is a part of the region characterized by territorial integrity and development features, within which regional development projects specific to this territory are implemented.

The provisions of the Law "On Cooperation of Territorial Communities" are very important for solving the issues of the development of the Kuialnyk estuary, since, as already mentioned, it is necessary to involve in active actions regarding the joint implementation of projects of several territorial communities located in the basin of the estuary or included in the range of stakeholders and affect the functioning of the estuary ecosystem.

The goals and objectives of the state regional policy (SRDS of Ukraine for 2021-2027, 2020) must be carried out in close connection with the objectives and programs of the Recovery Plan of Ukraine (3), taking into account the real needs for the activation of the effective use of the potential of communities and territories, since support economic development during the war and post-war reconstruction require a combination of spatial and economic factors for the rational placement of factories, infrastructure facilities and other enterprises in order to obtain the effect of the most possible stability and support of security. The key problems that must be solved in the process of post-war reconstruction are: planning the rational placement of enterprises, effective use of available resources, solving common problems of the development of territorial communities, which must be carried out in the format of cooperation, ensuring balanced (cohesive) development of various functional types of territories; supporting the development of points of economic growth as centers of generation of added value and resource provision of post-war reconstruction.

The role of projects related to the revival of the Kuialnyk estuary is seen to be closely related to some tasks of the Recovery Plan of Ukraine in view of the recreational value of this object, as one that will be able to contribute to the physical recovery and recreation of persons who have suffered injuries as a result of participation in hostilities, as well as the successful implementation of a system of projects related to the restoration and development of the Kuialnyk estuary will contribute to increasing the level of well-being of the local population.

The long-term experience of implementing the regional development policy of the EU countries (Cohesion policy 2021-2027, 2020) shows the need to combine spatial and economic aspects, since the effectiveness of self-development and the inclusion of local economic systems in the international economic exchange depends on the effectiveness of the involvement of the resource potential of territories in the processes of social production. from the rationality of the placement of economic objects, depending on the pre-determined and scientifically substantiated specialization of the territory. The integration of various dimensions and characteristics of regions for the development of individual profiles of economic development support is one of the main approaches to the implementation of the European cohesion policy (the so-called tailored approach) (Cohesion policy 2021-2027, 2020). For the modern conditions of resistance to military aggression and the effective placement of industries, as well as laying the fundamental foundations for further post-war recovery with the prospects of ensuring long-term economic growth, it is necessary to apply a systemic approach to planning the development of territorial and economic systems, which should be combined with organizational and economic measures for the implementation specific current and strategic tasks of regional development. That is, it is necessary to draw up comprehensive plans for the territorial and economic development of regions and communities.

From July 2021, the Law "On Amendments to Certain Legislative Acts of Ukraine Regarding Land Use Planning" introduced a toolkit for the system of territorial and economic development support for communities - a comprehensive plan for the spatial development of the community's territory, which provides for coordinated decision-making regarding the integral (complex) spatial development of populated areas points with the
entire economic component and infrastructure, as a single system of settlement and management in the community and in the adjacent territories. However, a systematic and defining document needs specific tools to ensure the implementation of spatial development plans with individualization depending on the needs and preferences of the community.

The normative documents officially (Law of Ukraine On the principles of state regional policy, 2015) define the following 4 types of functional territories: recovery territories; regional poles of growth; territories with special conditions for development; areas of sustainable development. For all the listed types of functional territories, it is important to maintain and ensure balanced development and a sufficiently high level of cohesion in economic, social and other dimensions, therefore, an individual profile of organizational and economic measures to ensure spatial and economic development should be developed for each type.

Territorial communities located in the basin of the Kuialnyk estuary are characterized by significant differentiation of levels of socio-economic development, but those parts of the communities that are directly located in the basin of the Kuialnyk estuary are characterized by low indicators of socio-economic development and therefore can be classified as functional territories with special needs, but conditions must be provided for them to transform into points of economic growth and, in the future, into the territory of sustainable development.

The ecosystem of the communities of the basin of the Kuialnyk estuary is characterized by a significant supply of resources, but low efficiency of their use and involvement in the processes of social production, underdevelopment of the infrastructure, which creates significant threats to the population and the ecosystem itself. One of the principles of post-war reconstruction is "build-back better", which means the need to solve issues not only with the preservation of natural ecological resources and balneological values of the microregion in the basin of the Kuialnyk estuary, but also to ensure the economic development of communities, which will contribute to increasing the level of well-being and cohesion of the population. Solving existing problems in innovative ways with the effective use of modern instruments of state regional policy will make it possible to turn depressed micro-regions into points of economic growth, which, due to high rates of economic development and favorable prerequisites in the context of resource, personnel, infrastructure and other provision, are able to generate significant amounts of added value and financially-budgetary resources, which are absolutely necessary to support resistance to armed aggression, maintain an adequate level of security and ensure post-war recovery. The participation of all regions in the restoration of territories affected by military actions can be considered one of the forms of interregional cooperation and by strengthening territorial and economic cohesion due to the strengthening of economic ties at the level of horizontal interaction.

The provisions of modern regional policy in Ukraine are relevant and determine the objects, subjects, levels, forms, principles, methods, functions, powers, resources of ensuring socio-economic development of regions and communities. However, we believe that the issues of interregional and intermunicipal interaction remain insufficiently disclosed and detailed, including in the cross-border aspect and in dimensions of interaction between the state and regions and between regions. To ensure recovery and development on the basis of economic cohesion of territorial and economic systems in the post-war period, it is necessary to establish interaction and economic cooperation at the inter-municipal, inter-regional, cross-border, international levels. The practice of using community cooperation agreements shows the effectiveness of this tool mainly in the field of public services and administration, which allowed to significantly improve the quality of state services for the population, but the economic potential of inter-municipal cooperation agreements remained unrealized. The activity of communities using contracts as instruments of mutual support in the field of economic development is relatively low. For the period from 2014 until 2021 about 1,800 agreements were concluded, currently 980 agreements are listed in the register, of which no more than 5% directly relate to the sphere of economic development (Laiko et al., 2022), (Laiko et al., 2022). The purpose of the cooperation tool is to increase the relatively low capacity of individual communities, when combining their efforts within the framework of the cooperation agreement, their capacity increases significantly. However, the conditions of post-war recovery require the consolidation of even greater resources and efforts, therefore we consider it expedient to introduce a toolkit of regional agreements (between regions and the government, and between regions), which will allow the implementation of large-scale economic projects on a long-term basis, and increase the
confidence of potential investors in the safety of capital investments in projects of economic cooperation at the level of regions on the basis of establishing certain specialization profiles for them. Realization of the goals of recovery, increasing the level of cohesion and socio-economic development of regions on the basis of ensuring joint participation in the implementation of post-war reconstruction projects, cooperation of territorial communities and regions, creation and stimulation of the development of regional poles of growth can take place with the use of such forms officially defined in national legislation as:
- conclusion of agreements in the field of inter-municipal, inter-regional and cross-border cooperation;
- drawing up program documents, strategies taking into account aspects of participation in interregional and international division of labor, in projects of joint coordinated development of territories;
- joint participation in the creation of organizational and economic units, in particular in the form of industrial parks and other forms not prohibited by law, but even not clearly regulated, such as clusters.

In order to implement the listed forms of cooperation and stimulate socio-economic development in the context of ensuring post-war recovery, we suggest paying attention to the use of the following organizational and economic tools:
- involvement in the processes of development and adoption of strategic documents of partner communities and regions with the aim of expanding cooperation and extending cooperation chains, taking into account the aspects of material and resource, financial, personnel and other support;
- implementation of investment-oriented use of unscheduled revenues to local budgets to ensure the development of defense industries;
- attraction of funds of international program and technical assistance to the processes of supporting the development of entrepreneurship in communities in targeted directions;
- performance of coordination and security, organizational functions by subjects of state regional policy, stimulation of inter-municipal, inter-departmental and inter-regional cooperation and support of cross-border, international cooperation projects.

The implementation of the mentioned organizational and economic measures is recommended for consideration and implementation by the subjects of state regional policy, which are the President of Ukraine, the Verkhovna Rada of Ukraine, the Cabinet of Ministers of Ukraine, central and local bodies of executive power, local self-government bodies, and their officials. However, guided by the principle of subsidiarity, which is relevant for Ukraine and the EU, we consider it expedient to implement most measures at the local level, except for cases when there is a need to solve problems at a higher level.

Implementing the task of modern regional policy for the micro-region in the basin of the Kuialnyk estuary, it is worth emphasizing that a management system for the sustainable development of the territory should be organized, with the perspective of taking measures to clear the V. Kuialnyk riverbed and its tributaries, and their reconstruction.

We propose for consideration and implementation such a conceptual and methodological approach to ensuring the sustainable development of the Kuialnyk estuary and the communities of its basin and other related natural objects, in particular, the Khadzhibey estuary (Fig. 1).

Most of the issues related to increasing the volume of feeding the estuary with fresh water and ensuring the socio-economic development of the territories of the adjacent communities should be resolved jointly: by the management company of the eco-industrial park, the administrations of the territorial communities (Odesa, Usativska, Krasnosilska), and the administration of the Kuyalnik National Park. But the issue of improving the state of the Velikiy Kuyalnik River, restoring its bed and watercourse should be resolved, in our opinion, within the framework of the agreement on cooperation between the administration of the Kuyalnik National Park and the territorial communities of the Velikiy Kuyalnik River basin (Ivanivsk community of the Bereziv district of the Odesa region.)

Focusing on the previously identified key problems and tasks regarding the preservation and restoration of the Kuialnyk estuary as a unique ecosystem, we characterize the specific measures necessary to bring the estuary together with the adjacent communities to a proper state with the establishment of organizational and economic tools for the implementation of state regional policy in this microregion. One of the primary tasks that must be solved for the Kuialnyk estuary is maintaining the proper water level. In recent years, in connection with a steady increase in temperature, the rates of evaporation of water from
Institutional basis: Constitution of Ukraine, Goals of sustainable development, Recovery Plan of Ukraine, Laws of Ukraine "On the principles of state regional policy", "On cooperation of territorial communities", "On local self-government in Ukraine", "On local state administrations", "On cross-border cooperation", "On State Targeted Programs", "On State Forecasting and Development of Economic and Social Development Programs of Ukraine", State Regional Development Strategy 2021-2027, European Cohesion Policy 2021-2027, acts of the President of Ukraine, the Cabinet of Ministers of Ukraine, as well as international treaties of Ukraine, the binding consent of which was granted by the Verkhovna Rada of Ukraine, the Kuialnyk Estuary Preservation Program for 2019-2023.

Goals and objectives: ensuring the preservation of the Kuialnyk estuary and sustainable development and increasing the level of well-being and cohesion of communities in the estuary basin.

Implementation of measures to maintain the water level in the estuary, the level of mineralization normal for balneological purposes; maintenance of life together with the estuary of nearby water bodies - the Velikiy Kuialnyk River, the Khadzhibey estuary, etc.; replenishment of the estuary with fresh water based on its economical use and recycling; regulation of the salinity level in order to preserve the proper state of balneological resources and obtain additional valuable products; the formation of integration economic structures in the communities of the estuary basin with the aim of comprehensively promoting the improvement of well-being and cohesion in communities; formation of a holistic management system for the development of the Kuialnytsyi estuary basin based on the use of strategic tools, state regional policy measures, organizational and economic means of stimulating local development.

Principles: subsidiarity, capacity, stability and systemic efficiency, legality, cooperation and cohesion, stability, parity, openness, inclusiveness, progressiveness of changes (Build Back Better)

The main areas of ensuring the sustainable development of the microregion in the basin of the Kuialnyk estuary:

1) Ensuring the proper level of vital activity indicators of the estuary (water level, mineralization to preserve the therapeutic properties of oil, peloids, peloidogenesis and the life of microorganisms)

2) Organization of an effective management system for the processes of economic, social, and ecological development of the estuary based on the formation of a joint management body in the basin of the Kuialnyk estuary, whose actions should take into account the peculiarities of the functioning of the Kuialnytsky National Park;

3) Organization of production and integration economic structures aimed at effective use of estuary resources in public production, overcoming obstacles to sustainable development and obtaining increased added value;

4) Ensuring the development of communities in the basin of the Kuialnyk estuary together with related natural and economic objects (Khadzhibeyskiy estuary and Velikiy Kuialnyk, Kubanka, Dovboka, Korsuntsivska Balka rivers);

5) Activation of cooperation between communities of the estuary basin and implementation of joint strategies for socio-economic development of the micro-region;

6) Application of incentives to support business activities in the field of improving the infrastructural provision of resource availability of the Kuialnyk estuary;

7) Providing solutions to the problems of the Kuialnyk estuary from local to national levels, with the involvement of opportunities in international cooperation programs.

Organizational and economic mechanisms, measures, tools: cooperation agreements of territorial communities of the Kuialnyki estuary basin in the field of implementation of joint projects of economic development of the microregion; formation of a joint strategy for socio-economic development of the communities of the microregion of the Kuialnyk estuary basin; methodical toolkit (defined on a scientifically sound basis) for identification of limits, burdens and economic compensators of environmental impact on natural objects of the estuary basin; compensation mechanism for water users for the use of river resources of the estuary basin; an investment mechanism for stimulating community cooperation instead of a mechanism for equalizing the tax capacity of communities.

Methodical toolkit for monitoring and evaluating the effectiveness of measures to stimulate the sustainable development of the Kuialnyki estuary basin. Adjustment of goals and objectives, introduction of proposals for improvement of the institutional basis.

Figure 1. A conceptual and methodological approach to ensuring the sustainable development of the Kuialnyk estuary and the communities of its basin and other related natural objects, in particular, the Khadzhibey estuary.

*-Developed by the authors
the surface of the estuary have increased significantly, which leads to excessive mineralization, a decrease in the activity of peloidogenesis processes, and a deterioration of the quantitative and qualitative indicators and balneological characteristics of the mud and oozes of the estuary. Grounded and implemented with the support of scientists of the Odessa State Ecological University (Adobovskyi & Bohatova, 2013), (Tuchkovenko, et al, 2022) measures to replenish the estuary with seawater are emergency and temporary, and cannot be applied permanently, because, despite some positive consequences of this approach (increasing the amount of water in the estuary and a certain compensation of excessive evaporation, increasing the number of sulfate-reducing bacteria, the relative cheapness and simplicity of the method), there are significant negative consequences - the flow of minerals to the estuary increases in overtime volumes, this salt remains, while the water evaporates. Replenishment of the estuary with sea water is possible not throughout the year, but only in those periods when the sea water temperature is no higher than 8°C, which currently occurs from the beginning to the middle of December, very rarely - from the middle to the end of November, which is caused by global climate changes and warming. During the period of taking emergency measures and replenishing the estuary with sea water, according to the estimates of scientists of the Odessa State Ecological University (Adobovskyi & Bohatova, 2013), (Tuchkovenko et al., 2022) in Kuialnyk estuary accumulated an additional 1 million tons of salts. Therefore, in the future, the application of the approach to solving the water level problem with the help of seawater supply is limited and additional compensatory actions are required. In particular: increasing the supply of fresh water to the estuary, reducing the concentration of salts in the estuary by removing excess salt, i.e. organizing the salt industry. It is necessary to increase the volume of water inflow to the estuary to the level of -5.5 and even -5.8 m. according to BS (Evaluation of the possible alternative filling of the Kuialnyk estuary with the waters of the Black Sea, the Dniester River and other estuaries and water bodies, 2012), although some scientists provide data on less demanding target values, namely up to level -5.8, up to -6 meters per BS. Different target values are explained by different data on most of the morphometric indicators of the Kuialnyk estuary in different years and in different seasons, as well as by the volatility of these characteristics. One thing can be said for sure - the water level in the estuary should be raised and its water level should not be allowed to fall below the mark of -7.0 meters above sea level.

The natural and one of the best ways to fill the estuary with fresh water is to restore the flow of the Velikiy Kuyalnik River, but this option is difficult to implement from a physical and institutional point of view. In view of the fact that the Velikiy Kuyalnik river bed is excessively disturbed by illegal dams, dams, ponds and other structures, it is necessary to take measures for the practical implementation of decisions on the restoration of the river's water flow. Due to the complexity of solving this issue from an institutional and legal point of view, separate studies of this issue are necessary in order to determine the form, scenarios, directions and measures to eliminate illegal structures, increase the inflow of water, and improve the ecological situation. The physical difficulties lie in the fact that due to the significant disturbance of the ecology of the Velikiy Kuyalnik river bed, due to the natural processes of drying up of small rivers, due to significant disturbances of the silt layers of the river bottom, taking measures to clear the river bed will lead to a relatively small increase in water inflow, to an increase in drainage for a short time period, but this will require complex organizational solutions, the cost of the works will be high (about UAH 0.86 - 1 billion). Restoring the supply of fresh water to the estuary due to the clearing of the Velikiy Kuyalnik river bed will be able to bring no more than 5-10% of the normal supply volumes that were possible before the organization of additional artificial reservoirs due to changes in the natural ecosystem of the river.

The institutional complexity lies in the fact that it is rather difficult to implement the decision to stop illegal interventions in the river bed with artificial ponds, quarries and other hydrotechnical structures, of which there are more than a hundred along the river bed. This requires decisive action to combat corruption and political will.

To partially restore the volume of the flow of the Velikiy Kuyalnik river, it is possible to implement a project with the organization of an embankment channel along the river bed with the use of special concrete or more modern polymer liners, which will reduce water losses in areas with a disturbed silt layer. According to preliminary estimates, the cost of such works may amount to about UAH 1.5-2 billion. and additional organizational and economic solutions are necessary for project implementation. We offer a compensatory mechanism for compensation for damage caused to the natural ecosystem of the
estuary, which consists in applying an alternative approach to minimizing damage to the Velikiy Kuyalnik River from illegal anthropogenic water management facilities: either the liquidation of such facilities with payment for the work at the expense of the culprit, or permission for partial or the complete preservation of a certain hydrotechnical facility with the introduction of necessary modifications to its design with the minimization of fresh water losses and the accrual of regular deductions to the special fund for the restoration of the Kuialnyk estuary and the Velikiy Kuialnyk River. The proposed fund can be used to pay for cleaning, restoration and maintenance of the Velikiy Kuialnyk River, and control of additional hydrotechnical structures will be organized. For the implementation of such a compensation mechanism, the presence of the subject of water management relations, which will deal with the solution of this issue, is required. Such an entity can be the management body of the Velikiy Kuialnyk River basin and the Kuialnyk estuary, formed on the basis of a cooperation agreement between territorial communities (Odessa city community, Usativska, Krasnosiltska and Ivaniwka communities), with the participation of representatives of the Kuialnytskyi National Nature Park, as well as support of the State Agency of Water Resources of Ukraine, the Basin Management of Water Resources of the Black Sea and Lower Danube Rivers and other regulatory structures, authorities and local governments. The existing version of the Law of Ukraine "On cooperation of territorial communities in Ukraine" (Law of Ukraine On cooperation of territorial communities, 2014) allows for the use of a similar, combined form of community cooperation, however, for the actual implementation of this measure, consultation support, scientific support, as well as desire are required cooperation and real activity on the part of territorial communities located in the basin of the Velikiy Kuialnyk estuary and river. An incentive for cooperation, which can be offered by state authorities as part of supporting the implementation of state regional policy, should be a special regime of financial and budgetary calculations for communities participating in cooperation projects. But in order to carry out such an economic experiment, it is necessary to make appropriate decisions at the level of state authorities or make changes to the current legislation, in particular to the budget code, which determines the procedure for distributing tax revenues, other income, expenses, subventions, transfers and subsidies between local and higher budgets levels. However, it is necessary to take measures to stimulate economic and financial and budgetary cooperation of territorial communities, since the existing practice of applying cooperation agreements of territorial communities indicates a relatively low activity of local self-government entities in concluding such agreements, especially in the field of certain types of economic activity or in the direction of stimulating entrepreneurial activity population activity. Encouraging communities to cooperate by means of informational support, raising awareness, and scientific consulting is already actively carried out by state and regional authorities, scientific institutions, and public organizations, but, unfortunately, does not lead to a real increase in activity in this area (Laiko et al., 2022). In order to ensure the effectiveness of the community cooperation tool, in the case of the territory of the Kuialnyk estuary basin, it is worth proposing a toolkit of financial and economic stimulation of the process of community cooperation based on the partial replacement of the traditional and defined at the state level budget equalization tool of community capacity with measures of mutual financial support for the implementation of joint investment projects. That is, instead of a classic reverse subsidy, in part, in the amount of up to 50% of the amount of the appropriate reverse subsidy, it is proposed to apply the mechanism of joint financing of investment projects by communities that are officially identified as those that implement it.

Currently, the procedure for applying reverse subsidies is determined by the Budget Code of Ukraine and accompanying regulations. Therefore, the full application of this proposal is possible provided that appropriate changes are made to the current legislation, which is seen as a slow prospect. Therefore, it is worth proposing, as an economic experiment in the micro-region of the Kuialnyk estuary, instead of reverse subsidies, a mechanism for offsetting the amounts of financial assistance from community budgets for the investment development of the micro-region. The role of the central authorities, in this case, will consist in the official announcement of such an economic experiment by issuing the corresponding normative act. The conditions of the experiment should include responsibility for compliance with the conditions of investment in the restoration of the Kuialnyk estuary ecosystem in the form of the number of economic entities that have intensified their activities in the field of preservation and restoration of the Kuialnyk estuary, the number of jobs created, the volume of additional capital investments from the private sector, at the expense of...
of foreign investors, funds of international organizations.

State stimulation of the processes of community cooperation in the basin of the Kuialnyk estuary in the context of the implementation of joint projects for the restoration of the estuary is a necessary condition for the initiation of real changes in solving the problems of the estuary and a guarantee of the authorities' interest in the final result in the form of achieving high values of indicators of sustainable development of the estuary ecosystem.

The conclusion of an agreement on the cooperation of the communities of the Kuialnyk estuary and the introduction of special conditions for investment support for the implementation of estuary development projects will ensure the formation of favorable conditions for the development of business activities in the adjacent communities, both in the field of tourism and recreation, and in related areas. On the basis of the signed cooperation agreement, it will be possible to form an effective management system for the development of the estuary based on the combination of efforts of state authorities (in particular, the Odesa Regional State Administration), local governments (Odesa, Kranosil, Usativ, Ivanivka communities), regulatory bodies (the State Agency of Water Resources of Ukraine, Basin Management of Water Resources of the Black Sea and Lower Danube Rivers and others), management bodies of the "Kualnyk" sanatorium and the "Kualnytskyi" National Park, other organizations and departments within their powers.

Formed management bodies will be able to more effectively ensure the development of estuary ecosystems on the basis of the development and implementation of an appropriate strategy. We believe that the adoption of a strategic document that defines the prospects for the development of the Kuialnyk estuary microprom region and ways to achieve specific goals is necessary. Currently, the legislation of Ukraine stipulates that documents for strategic planning and implementation of state regional policy are drawn up at the national, regional and basic (territorial communities) levels, however, for micro-macro-regions, the official order of strategizing is not defined, although there is a real need for strategizing the development of territorial economic units exist.

The solution of specific problems regarding the regulation of the water level and its salinity in the Kuialnyk estuary is connected with the implementation of specific projects, in particular: clearing the channel of the Velikiy Kuialnyk river, regulation of the level of brine mineralization due to the organization of the salt industry, as well as the organization of effective wastewater treatment and supply to the Kuialnyk and Khadzhibey estuaries. Therefore, we propose to implement the following specific projects that should ensure the good ecological condition of the Kuialnyk estuary:

organization of production, regarding the extraction of salt and other useful products from brine, with the return of desalinated water to the Kuialnyk estuary:

- the organization of an integrated economic structure that will perform the functions of high-quality wastewater treatment from the northern direction of the city of Odessa (biological treatment station "North") with the production of fertilizers and other products that will have economic applications from sewage sludge

A number of methods of removing excess salt from the estuary are related to its beneficial use.

You can remove excess salt from the estuary in various ways. It is possible to pump the hypersaline water of the estuary to the sea. With a 10:1 ratio of the volumes of water poured into and pumped out of the estuary, the salt level in the estuary will be maintained at a constant level. For this, it is necessary to lay an additional pipeline with a diameter of about 20 cm (Therapeutic muds (peloids) of Ukraine, 2006). When laying such a pipeline, it is necessary to place its intake device at the maximum distance from the bottom, so that bottom sediments are not sucked into the pipe, and in areas with maximum depths, but not far from the shore of the southern part of the estuary. Organized in this way, the salt industry will remove excess salt from the estuary, and return desalinated water to the estuary.

Salt mining in the estuary was carried out from 1861 to 1931, and 1.5 million tons of it were extracted in 70 years (Tuchkovenko et al., 2022). Moreover, Kuyalnitsa salt was one of the best in Europe. Currently, due to the temporary occupation of Soledar, the relevance of own salt production for Ukraine has increased significantly. It should be noted that the extraction of salt in the Kuyalnytsk estuary will not cover the country's needs for this product, but even in the 19th century, salt mining was organized not so much for the extraction of salt as for the regulation of the salt balance in the estuary.

State Enterprise "Artemsil" produced about 2 million tons of salt per year. In addition to meeting Ukrainian needs, salt was also exported to 15 countries around the world. With a daily recommended rate of salt consumption of about 6 grams, the annual need of Ukrainians for salt is about 60-80 thousand tons. Taking into account the
needs for canning and industrial use, the annual volume of the domestic salt market in Ukraine is about 330,000 tons (according to the Ukrainian Business and Trade Association (UBTA) and the Ukrainian Research Institute of the Salt Industry).

Ukraine's need for salt will not be completely covered by the Kuialnyk mine, but if salt is mined in volumes no less than in previous years, almost 20,000 tons of Kuialnyk salt (food, cosmetic, and technical) will be obtained annually. Extraction of salt from the Kuialnyk estuary will be auxiliary along with extraction from the Solotvy deposit in Zakarpattia, the Drohobytsky saltworks and others. Excess salt is proposed to be removed with the help of a reverse pipeline, which discharges the hypersaline water of the estuary to the Odesa Bay, by organizing a salt industry in the estuary, by extracting pink salt, using salt as bath salt and cosmetics. Estuary brine is an almost unlimited raw material base for medicines containing magnesium. But with the extraction of hypersaline water of the estuary, valuable substances that can be used in medicine and cosmetology will be extracted from it.

A comprehensive solution for providing fresh water to the Kuialnyk estuary and ensuring the development of the economic systems of adjacent communities can be provided within the framework of the above-mentioned cooperation agreement with the organization of a joint system and on the basis of the formation of an integrated economic structure in the form of an eco-industrial park. This project will provide:

- preservation and restoration of the Kuialnyk estuary;
- improvement of the condition of the Khadzhibey estuary, its protective structures;
- reconstruction of treatment facilities (Biological Treatment Station (BTS) "North").
- solving environmental problems of the Khadzhibey estuary, "filtration fields" on the territory of Odesa;
- increasing the level of social and economic development in the communities of the estuarine basins, creating additional jobs, increasing the level of well-being, creating new enterprises;
- bringing the quality of purified water to the highest standards and requirements, feeding Kuialnyk and Khadzhibeysky estuaries with purified water;
- industrial processing of concentrated sewage sludge that will remain after cleaning, obtaining useful processing products (liquid and granular fertilizers, materials for road construction, etc.);
- reconstruction of the Khadzhibey estuary dam;

- solving environmental, social, and economic problems related to the "filtration fields" by placing on this territory enterprises for the treatment and processing of sewage sludge and, in the future, a waste treatment plant.

We believe that such an approach is appropriate, as it solves many problems that exist in the territory of the communities of the Kuialnyk and Khadzhibey estuaries.

The problem related to the Kuialnyk estuary is the problem of the water level in the Khadzhibey estuary. If there is usually a shortage of water in the Kuialnyk estuary, then there is an excess of it in the Khadzhibey estuary, and it also receives from 40 to 85 million m³ of water annually from the "North" biological treatment station (BTS). At the same time, there are threats of overflowing the estuary in years with increased precipitation. This requires strengthening of the dam that separates this estuary from the county road. On the other hand, the Khadzhibey estuary should not have a low water level so that it does not dry out in the upper reaches with low annual precipitation. That is, the water level in the Khadzhibey estuary, as in the case of the Kuialnyk estuary, must be regulated. Usually, the water level of the Khadzhibey estuary is sufficient and part of the water from the BTS could be directed to the Kuialnyk estuary. In case of a low-water year, all the water of the BTS could be directed to the Khadzhibey estuary, and the Kuialnyk estuary could be replenished with sea water. But the implementation of this perspective plan is hindered by the extremely poor quality of the BTS cleaning equipment, which heavily pollutes the Khadzhibey estuary and prevents the use of this water for discharge into the Kuialnyk estuary.

During the construction of the new BTS, the old one must work. But the set of equipment of the new station is unlikely to allow it to be placed in the old premises by the method of phased replacement. In order to preserve the existing pipe communications as much as possible, it is proposed to build the new BTS next to the old one, somewhat north, towards the filtration fields or with partial use of their areas.

During the creation of a new BTS, it is necessary to decide the issue of disposal or beneficial industrial use of the concentrate remaining after wastewater treatment. The production of granular nitrogen, phosphorus and potassium fertilizers from the appropriate salts contained in the concentrate can be proposed as a beneficial use. To do this, you need to separate these salts from the concentrate. BTS concentrate can also be used for the production of bricks or
other building materials, as is done in the EU and Israel. The remains of the concentrate, the beneficial use of which is impossible, are suggested to be drained beforehand and used as material for road construction.

In order to minimize the impact on the environment, to obtain maximum economic and ecological effects, we believe it is expedient to create an eco-industrial park on the territory of the "filtration fields", the activity of which will be based on the principles of industrial synergy and striving for zero waste.

There is a large amount of garbage on the filtration fields and in their vicinity - landfills. This garbage must be processed, for which it is advisable to build a garbage and waste processing plant.

The creation of an industrial park with the prospect of its development into an eco-industrial one will allow solving most of the problems of the Kuialnyk, Khadzhibeysky estuaries, "filtration fields", the problems of waste processing of the city of Odessa and cleaning the sewage output of the BTS "Northern", and will also ensure the production of many useful products (salt, medicinal, cosmetic means, fertilizers, construction materials, fresh water for irrigation, and it will also become possible to produce electricity and thermal energy at the waste processing plant); will ensure attracting investments, creating new jobs and increasing taxes in the budgets of local communities.

Taking into account the above, we can talk about the need to create an eco-industrial park in the area of the filtration fields, which will solve the tasks of wastewater treatment, processing of concentrate from BTS with separation of salts and creation of fertilizers, production of building materials, incineration of unused concentrate residues and industrial, ecologically clean, incineration of garbage and waste processing.

The Strategy for the Development of Industrial Parks (2023-2030) adopted in Ukraine envisages the creation of eco-industrial parks as priority forms of industrial parks that will ensure the sustainable development of communities and the entire country. The existing substantial benefits for industrial parks in Ukraine, from taxation, customs clearance of goods, raw materials, equipment, and components make the industrial park on the territory of the filtration fields promising and interesting for investors. The conditions for the application of tax benefits, subject to the long-term reinvestment of profits, make such a project interesting for the communities of the basin of the Kuialnyk and Khadzhibeys estuaries.

Since the proposed eco-industrial park should be located on the lands of the city of Odessa, the initiator of the park's creation should be the Odessa city community, which will also form and coordinate the activities of the park's management company. Cooperation with other territorial communities on issues of formation and development of industries, regulation of the supply of purified fresh water, which will inevitably arise, should be carried out within the framework of concluding a multilateral agreement on cooperation (according to the Law of Ukraine "On Cooperation of Territorial Communities").

As part of the community cooperation agreement, the management company (as a joint body for coordinating the processes of development of territorial and economic systems of adjacent communities) will coordinate actions and decisions with communities, basin councils, and Kuialnytskyi National Park. A more detailed study of all aspects of the organization and operation of the eco-industrial park on the territory of the "filtration fields" will be carried out in further studies devoted to the justification of the parameters and conditions of the formation of the eco-industrial park.

**Conclusions and perspectives of further research.**

Based on the study of the key problems of the Kuialnyk estuary and the territorial communities located in its basin, the main directions, ways and tools for solving the problems of preserving the resources of this natural object and ensuring the sustainable development of the microregion of communities and territories adjacent to the Kuialnyk estuary have been determined. Given the presence of common issues in the field of economic development, infrastructure and improvement of the ecological condition of the estuary, the communities and territories located in its basin can be conditionally defined as a micro-region in which joint projects of regional and local development will be implemented. Key directions for improving the socio-economic and ecological condition of the Kuialnyk estuary include ensuring the proper water level of the estuary and the state of its main resources, forming an effective management architecture for the development of the estuary and adjacent territories as a complete natural and economic ecosystem, increasing the efficiency of using the resources of the estuary basin in public production in order to increase the welfare of communities, support the processes of reproduction of natural resources on the basis of responsibility for the goals of sustainable development, which will allow to be more actively
included in international cooperation programs and to attract additional resources and investments in projects of sustainable development of communities. The scale of the main measures and directions for ensuring the good ecological condition of the Kuialnyk estuary and the socio-economic development of the adjacent communities require the activation of cooperation between local self-government bodies, the population, public organizations, scientific and educational institutions, which will allow the consolidation of financial and other resources to solve joint tasks of preservation and improvement of the state of the natural potential of the estuary, as well as improving the well-being and quality of life of the local population and all stakeholders interested in the qualitative development of the microregion's recreational, tourist, transport, and economic infrastructure. Stimulation of the cooperation of territorial communities in the context of solving joint tasks of preserving and developing the complex natural and economic resources of the estuary and ensuring the socio-economic development of communities will correspond to the key goals of modern state and European regional development policy, as well as the tasks of the Recovery Plan of Ukraine.

The need to attract significant private investments in the restoration and development of the infrastructure of balneological treatment, tourism, water purification and in other important areas of ensuring the vitality of the ecosystem of the Kuialnyk estuary and related objects determines the appropriateness of the creation of integrated structures, in particular, an eco-industrial (eco-recreational) park, which will allow not only to consolidate financial and material resources around solving the problems of the estuary, but will allow state and local self-government bodies to apply tax and other benefits to ensure the development of priority activities aimed at the sustainable development of the microregion.

The following central problem was identified in the conducted research - the justification of the best way to replenish the estuary with fresh water of appropriate quality, which is due to both anthropogenic influence (disruption of the channel and flow of the Velikiy Kuyalnik River) and objective natural processes - an increase in average temperature and an increase in drought, which causes excessive evaporation of water from the estuary increases its mineralization and negatively affects the quality of balneological resources. The best solution to this problem, in our opinion, is the supply to the Kuialnyk and Khadzhibesky estuaries of thoroughly purified water from the biological treatment station, which will require its complete reconstruction and the organization of production from the complex processing of water treatment waste in the form of an eco-industrial park, located, as previously proposed, on filtering fields. This approach corresponds to the goals of sustainable development, ensures a frugal attitude to resources and allows to improve the socio-economic and ecological situation in the abandoned territories of the Odesa, Krasnosil, Usativ, and Ivanovo territorial communities.

The prospect of further research is the substantiation of an effective management system for the development of the Kuialnyk estuary basin as a recreational and economic natural asset based on the consolidation of the efforts of authorities and local self-government with relevant regulatory bodies and the Kuialnyk National Park.

REFERENCES


Institute of Marine Biology of the NAS of Ukraine (2013). Zakliuchny zvit z naukovo-doslidnoi temy Prohnozuvannia zmin ekologichchnoho stanu Kuialnyk priy yoho napovnenni morskoi vodoi. [Prediction of changes in the ecological state of the Kuialny estuary when it is filled with seawater]. [in Ukrainian]

Institute of Marine Biology of the NAS of Ukraine (2018). Zakliuchnii zvit pro vykonannia 3-ro etapu roboty «Naukovo-doslidnyi roboty z hidrobiologichnoho obstezhennia stanu Kuialnytskoho lymanu ta morskoi vody z Odeskoi zatoky» [Final report on the implementation of the 3rd stage of the work “Scientific research works on the hydrobiological survey of the state of the Kuialny estuary and sea water from the Odesa Bay”] [in Ukrainian]


Odessa State Environmental University (2012). Otyskna mozhlyvo ho alternatyvnoho napovnennia Kuialnytskogo lymanu vodamy Chornoho moria, richky Dnister y inshykh lymaniv i vodnykh obiektiv [Evaluation of the possible alternative filling of the Kuialny estuary with the waters of the Black Sea, the Dniester River and other estuaries and water bodies]. [in Ukrainian]


Poliaiko, I.V. (2012) Teoretyko-metodolohichni osnovy ekolohitatsii upravlinnia terytoriimi obmежenoho statusu vykorystannya (na pryladu kurortno-rekreatsiinoi zony Kuialnyk) [Theoretical and methodological bases of green management of territories with limited use status (on the example of the Kuialnik resort and recreation zone)] Economic Innovations, 48, 185-191. [in Ukrainian]


Rubel O.Ye. (2013) Rozvytok ekonomiko-insytutsiinoi bazy vyrishennia konfliktiv pryrodokorystuvannia na pryladu lymanu Kuialnyk [Development of the economic and institutional basis for solving nature use conflicts on the example of the Kuialny estuary]. Economic Innovations, 53, 199-212. [in Ukrainian]

State Institution «Ukrainian Research Institute of Medical Rehabilitation and Resort Therapy of the Ministry of Health of Ukraine» (2013). Otsinka yakosti peloidiv Kuialnytskoho lymanu pry modeliuvanni zmín umov ikh pryrodnoho stanu pislia zapovnennia morskoiu vodoiu [Evaluation of the quality of peloids of the Kuialnyk estuary when modeling changes in the conditions of their natural state after filling with sea water]. [in Ukrainian]


Ukrainian scientific center of Ecology of Sea (UkrSCES) (2010). Stan navkolyshnho pryrodnoho seredovyscha v Odeskii oblasti [The state of the natural environment in Odesa region] [in Ukrainian].

