

Ecosystem and Social based approaches for adaptation to climate change and preventing a water conflicts and in Central Asia

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Sectoral and resource management approach, lack of ecosystem management. Today, the sectoral and resource-based approach is still used in planning programs and projects at all levels - from the global to the local, which ultimately leads to the opposite results, worsening both the quality of life and environmental sustainability. As a result of sectoral and administrative-territorial planning in the state programs and plans of Central Asia, known to be extremely vulnerable due to the arid climate and lack of access to the world ocean by aquatic ecosystems, there are no goals for the preservation of aquatic ecosystems - the basis for climate change adaptation and sustainable water supply for the economy, the public and the nature. In the economise focused on maximizing the use of natural resources, such goals are not much needed - they are replaced by goals on increasing production and consumption, dams and weirs that destroy the natural basis of the economy and ultimately impede all the SDGs.

The full implementation of the ecosystem approach requires a different management system, and the localization of SDGs based on ecosystems makes it possible to establish exact and reasonable values for all the goals and gives a clear understanding of how exactly the various sectoral goals (water, energy, food, poverty, education, etc.) are **logically, spatially and quantitatively interconnected**. It creates the basis for the full integration of the actions of various economic players. As in the human body, where all the vital systems are interconnected and have precise parameters that are important for life and health, the localization of goals must be taken not within administrative boundaries, but **on the basis of natural ecosystems**, indivisible into administrative boundaries, taking into account a complex but stable system of connections between wildlife and all environmental components. Only with this approach, the goals and actions of various economic programs, conflicting in the current management systems because of their imaginary independence, will take their place in the common system of natural and technological processes and create synergy.

For the Central Asian conditions, management should be based **on ecosystems of river basins**, representing integral natural complexes covering the entire territory of the country, the state of which is the basis and the main limiting factor for economic and social development. An example of the ecosystem approach is shown below.

The example of the new model based on an ecosystem and social approaches

The Balkhash-Alakol basin is proposed as a **model for transforming the long-standing problems into opportunities for a green economy and sustainable development**. The basin is one of the world's largest lake ecosystems with an area of 512 thousand km² - more than GB, Holland, Denmark, Switzerland and Belgium all together. As the entire and indivisible system, it is an integral organism with its population, industries, water, land, and mineral, biological and other resources, transport, and energy and tourism infrastructure. At the same time, Lake Balkhash itself plays the role of a unique and irreplaceable natural regulator of ecological balance, supporting the life of more

than 50,000 rivers, lakes and watercourses that regulate the climate and support biodiversity and provide water to industry, population and agriculture, energy facilities and public utilities. The basin contains 12 types of ecosystems (from glaciers to deserts), reserved areas and natural parks – with the territory of more than 4,000 km², including the state nature reserved area and the state forest, farmland and pastures - with the territory of more than 23.0 million hectares. The unused potential for investments and a green economy in this basin includes renewable energy (more than 500 MW), shipping (55,000 tons of cargo/year), fisheries with a potential of more than 53,000 tons of fish products/year, sustainable tourism and others. At the same time, the lake itself plays a fundamental role in the natural cycle of the exchange of energy and substances, evaporation and precipitation, the flow of water over the surface and underground.

At the same time, due to the lack of integral ecosystem management, the basin continues to degrade: there are only 5 out of 16 lake systems remaining, more than 150,000 km² are deserted. According to **McKinsey estimation, water deficit in the basin may reach 1.9 billion m³ by 2030** as the result of current development, transboundary water abstraction and climate change, which will cause irreversible degradation of the entire ecosystem with growing economic damage and social consequences similar to the disaster of the Aral Sea.

However, the lessons have not been learned: the current state program for water resources management in Kazakhstan repeats previous approaches and does not set the main goal of preserving this vulnerable ecosystem as an indispensable and key condition for sustainable development of this region. The program is focused mainly on the goals of economic growth: an increase in the area of irrigated land and the construction of new reservoirs, with an increase in budgetary expenditures and the loss of the very possibility of saving this unique ecosystem, on which the well-being of millions of people who live there depends. With all the understanding of this problem and undeniable arguments, the government is not ready to change the management, while maintaining their destructive resource-based approach. At the same time, the transition to ecosystem management will make it possible to stop growing environmental threats, adjust existing programs, clarify the links between all stakeholders and identify actions that are important not only for preserving the natural basis of social well-being and economic development, but also for the sustainability of all the sectoral and territorial programs and private sector projects that are being implemented.

Practical steps for shifting to Ecosystem based management

Back in 2007, the government of Kazakhstan adopted a resolution based on the recommendations of the EU project on integrated management in the Balkhash-Alakol basin which stated the following: ‘The existing basin’s territory management system based on fragmentary powers and short-term actions does not provide basin’s current problems solution and the territory development, and doesn’t contribute to the consolidation of the actions of central and local authorities, the state, the civil society and the private sector. "One of the main results of the analysis is the conclusion about the need to improve the management system in the Balkhash-Alakol region as a key condition for launching and implementing the program, the transition to integrated planning and management, and the involvement of the existing potential of the region." The decree instructed “to study the possibilities of introducing ecosystem management on the basis of the basin principle with an international examination of the project called “Regulation on the basin management body”. "In general, the basin management system being formed will set the parameters for further improvement of the administrative-territorial organization of the region and the territory planning system." Thus, an attempt was made to transition to ecosystem management. But decisions at the governmental level were not enough and more basic changes were required.

¹ Green economy strategy for Kazakhstan, McKinsey, 2012

With an ecosystem approach in relation to this basin, the current main goal of the state program for providing water to economic needs remains, but will be linked to a **higher level goal - the conservation and restoration of lake and river ecosystems**, including the protection of water sources and catchment areas, mountain and forest ecosystems, emission, discharge and waste reduction. The integrated sum total of all plans and actions in the basin should be the **lake level of at least 341m**, which means the balance between inflow and discharge of water - **the common and integrated indicator of the all sectoral goals and for the global environmental sustainability** and indicator of coordinated and sustainable economic activity and social well-being in the basin.

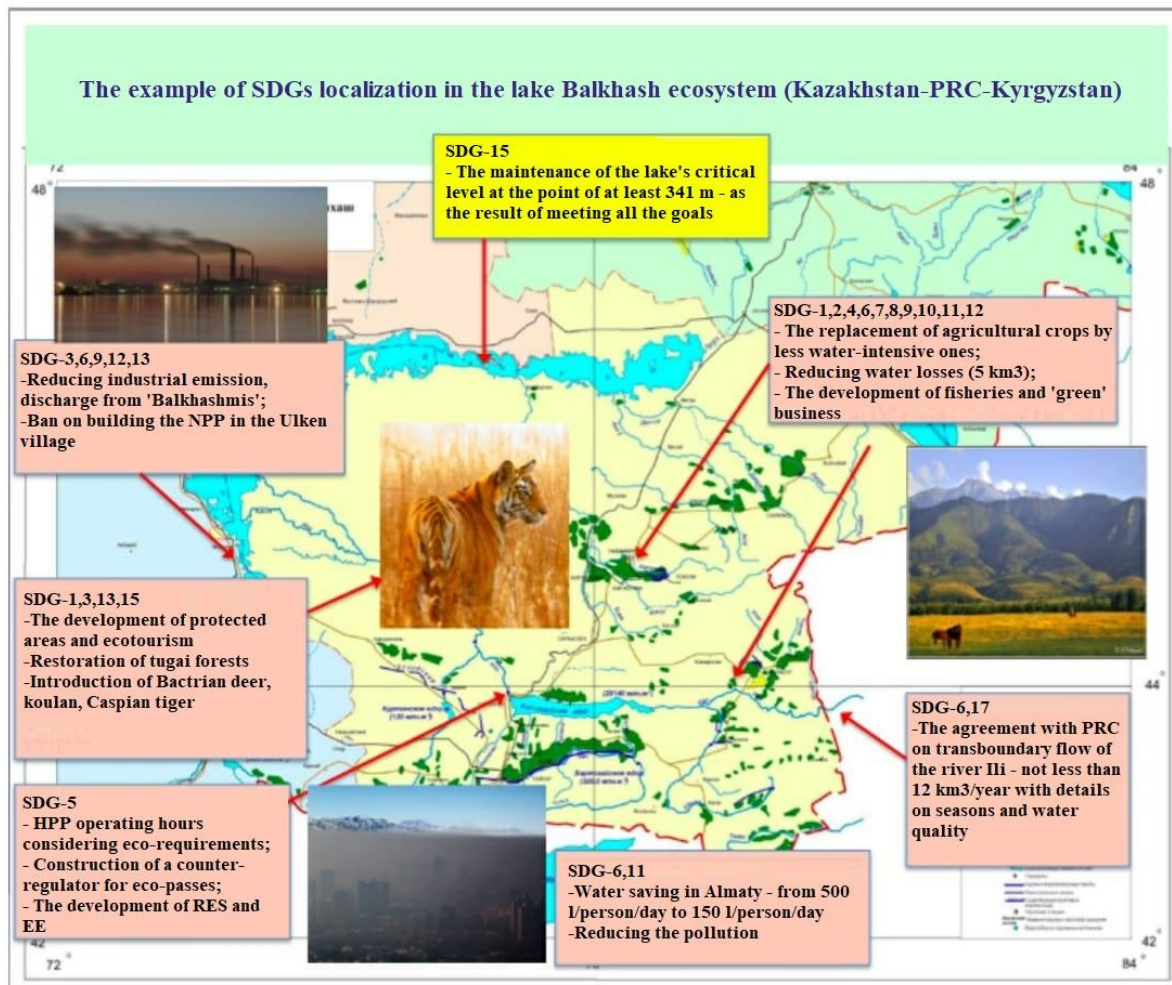
To achieve this goal, it is necessary to solve the three main following two sub-goals:

1. The guaranteed volume of internal surface runoff in the basin is at least **25 km³ / year**;
2. World-class international agreement with the China (and Kyrgyzstan) on transboundary flow - not less than **12 km³/year**.

Sub-goal 1. will require correction of all sectoral goals and programs of the economy: agriculture and energy, public utilities, industry and other sectors - with reasonable quantitative and interrelated indicators, e.g.:

- **In agriculture:** reducing water losses and replacing water-intensive crops, including rice, on an area of at least 25,000 hectares (it will also require targeted support from farmers), prohibiting the expansion of irrigated land without guaranteed water resources;
- **In industry:** reducing emissions and stopping discharges (with a package of a new green standards and technologies, economic and other instruments);
- **In the energy:** changing and adjusting the operating modes of all HPPs, construction of the Kerbulak counter-regulator to support environmental flow;
- **In the communal sector:** water saving and reduction of water losses (for example, in Almaty - it is necessary to reduce the consumption from 350-500 to 100-150 l/day/person, including the ban on car wash using drinking water), development of renewable energy sources and other areas of a green economy;
- **In nature conservation:** restoration of the lake delta, tugai forests and biodiversity, development of eco-tourism, natural parks, reserved areas and the introduction of the Turanian tiger (as an indicator of forest restoration and biodiversity).

Only the basin management of the above mentioned and other sectoral and territorial programs will ensure the preservation of the ecosystems of the basin for the sustainability of economic activity and social well-being in this large region and support of the global SDGs at the national level. For this large territory of the planet the main goal of sustainable development is the level of the lake (341 m) - the main condition for environmental sustainability of the entire territory, to achieve all economic, social and other SDGs. All the goals in the energy, agricultural, communal, industrial and other sectors in the aggregate should give this main goal. At the same time, using the basin approach they all receive their exact quantitative value and physical relationship and dependence on each other - just like in a human body- all parameters for your health should have exact figures (temperature, pressure, etc.) - no more and no less!



The world has accumulated various experiences in the transition to ecosystem management. Many countries adopted special laws, for example, in the USA back in the 30s a Federal Law was adopted to stop sectoral conflicts and halt environmental degradation in the Tennessee Valley. The EU, Canada, Japan and other countries have also adopted laws and special programs and mechanisms to support ecosystem management.

At the same time, successful international experience shows that:

- **River basins should be the basis for territorial planning and management** as integral and indivisible management objects and for the full integration of sectoral and administrative-territorial programs into sustainable development programs.
- **Objectives to preserve the ecosystems of the basin should be identified** as a key condition for sustainable economic activity and social development (the same as we have in the UNFCCC Paris Agreement).
- **Alienation of the population** and nature users from nature and territory management, distribution of risks and benefits should be overcome and formalized.
- **Basin management bodies should have the necessary authority and responsibility** for the long-term water, land and energy use, infrastructure management, and for attracting investments.

In Kazakhstan, such reforms are possible through the adoption of the "Law on Lake Balkhash" with the main directions and clear objectives of the program, with the creation of an authorized governing body. At the same time, the creation of a basin management working body is a primary and necessary condition for launching such a program. The other principal barrier - people still do not see these problems as personal. To overcome alienation, market economy failures and fragmented management, transferring conflicts between the state, business and the public into engaged

cooperation, it is proposed to create a management in the form of a **Basin Social Corporation**. Its main difference (from industrial and financial corporations) is that the activities of a social corporation are aimed at integrating social, environmental and commercial effects. With that, long-term environmental and social goals are a priority, and management mechanisms stimulate the development of green sectors of the economy and restrain the desire for profit at any cost - at the expense of the destruction of natural and social potential.

Basin social corporation as an open joint-stock company with the participation of the public, the state, business and all natural resource users as owners:

1. **Overcomes alienation and changes the behavior** of the private sector and the population for engaged participation in the development of the territory based on their ownership.
2. **Creates a focus on long-term goals and social benefits**, including health and education - not only on profit.
3. **Eliminates social conflicts** and unites the actions of the state, business and civil society, based on their ownership and shares in green business;
4. **Is more open to use different forms of financing** and creates more efficient and transparent mechanisms for sustainable economic activity (income from activities, fees for services, ecosystem payments, green bonds, etc.).
5. **More efficient in the development of green technologies and of the basin infrastructure** management (dams and power plants, fisheries, irrigation, tourism and other facilities).
6. **Resolves trans-border conflicts with more effective tools** on the basis of joint management of the basin, taking into account the common goals and interests of all parties;
7. **Does not exclude, but complements and helps** in the implementation of state, departmental and territorial programs, state control and monitoring systems.

The basin management system will change the ongoing destructive processes. Financing decisions for any programs and projects from state, local budgets and the private sector, as well as new projects in the basin will make the maximum contribution to the achievement of common goals, thereby increasing the sustainability of all sectoral, territorial and business sector programs. The existing systems of planning and regulation, monitoring and control, education, information and public participation shall also be improved and interconnected based on specific targets and common goals.

This innovative management model will go beyond the traditional choice at the practical level: «economy or environment» and will open new perspectives for the population and business. It will provide governments with innovative solutions to achieve the SDGs, develop green economy and sustainable employment, and take control over growing social problems and dependence on climate change, while improving the quality of life and environmental sustainability.