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**ENVIRONMENTAL CAPITAL AS A MOVING COMPONENT IN TRANSFER TO THE  
ECOSYSTEM MANAGEMENT IN THE ILI-BALKHASH BASIN**

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**Introduction**

The Ili-Balkhash basin (IBB) is one of the largest ecosystems on the planet and a unique natural complex. It occupies over 13% of the territory of Kazakhstan, with 1/5 of the country's population living here. Power engineering and industry, agriculture and municipal economy, natural and cultural heritage, social and geopolitical issues are closely connected in the single knot of this natural-economic complex. November 2000, as initiated by the community and supported by the government and local bodies, saw the Balkhash-2000 international forum, which revealed an alarm tendency of the basin degradation: continuous desertification, difficulties with potable water supply and high level of industrial wastes, reduced agricultural activity, no hydropower development, reduced biological resources. All these affect the basin economic development and well-being of the population. Along with the issues faced by the basin there are external factors, endangering further development of the region. They include the economic activity of China in the catchment basin and negative consequences of the climate change. The Concept of the Programme of the IBB sustainable development, developed by the Central Asian Regional Environmental Center, as recommended by the Forum and ordered by the Ministry of natural resources and environmental preservation, is the product of the first stage of activities. This document is based on major prerequisites of the Environmental Space Concept:

- Planning and running of any activity should be based on the integration of economic, social and environmental issues and take into account the limited possibilities of natural ecosystems.
- Involvement of all those concerned at all the decision-making levels enhances a more efficient solution of the development issues.

In summer 2005 the Central Asian Regional Environmental Center, supported by the European Commission TACIS programme, launched the project of introduction of the ecosystem management in the Ili-Balkhash basin, aimed at implementation of the Concept of sustainable development, whose main objective is to stabilize the social-economic and environmental situation in the region without damaging the environment and future generations.

**Natural-economic potential of the basin**

?. **Water resources** are a basis for the IBB vital activity. The basin comprises over 45 thousand rivers, temporary channels and ravines 118 thousand km. long. The largest of them Ili-river (up to 75% of the basin catchment area) makes a delta of 8 thousand sq.km. when falling into Balkhash. There are about 24 thousand lakes and artificial reservoirs in the basin, besides rivers. The lake of Balkhash is the third largest closed reservoir in Kazakhstan. Its level is one of the main indicators of the condition of the entire basin ecosystem. Before the stream was regulated, its level

was cyclically changing, mainly, between 341 and 342 m. After the Kapshagay hydroelectric power station was built, the level of the lake has been below the 341 m. mark from 1984 to 1989. The basin economic development was accompanied by the construction of artificial reservoirs: Kapshagayskoe reservoir (28.1 mln.cubic km.) on the Ili-river, Bartogayskoe reservoir (320.0 mln.cubic km.) on the Chilik-river. There were established rice irrigation systems with the total diversion capacity of 166 mln. cubic m. a year. The artificial hydrographic network is represented by a system of irrigation and discharging canals. In 2000 Kazakhstan received 4.48 cubic m. and China – 15.09 cubic m. out of 19.6 cubic m. of the Ili watercourse. The Ili-Balkhash basin has a large stock of fresh groundwater. Their total estimated exploitation resources make 17.5 cubic m., used insignificantly, and the region has reserves in water provision.

Water resources are the most valuable resources in the basin since they predetermine the stability of its vital activity. But presently the net value of water resources is very low due to an underestimated water capital.

**?. Mineral raw material resources** make the basin one of the priority regions in the development of the productive forces of Kazakhstan. It has deposits of nonferrous, rare and precious metals. A summary stock of brown coal is estimated to make 12 billion tons, 5.4 billion of them are good for open-cut mining. The basin is rich with raw material to produce construction materials – cement, marble, sand, detritus as well as clays for porcelain production and carbonate raw material for sugar-manufacturing industry.

**B. Biological diversity** of fauna covers about 50 species of mammalians, 269 species of birds, over 20 species of fish. There are different kinds of plants, growing in sands, clay and loamy soils, saline and waste lands, in meadows and forests, among which there are unique river gallery forests (tugai) in the river flood-lands, on the banks and in reservoirs. Sheep and goats, cattle, horses and camels graze on natural pastures. Amateur hunting for game is flourishing.

**C. The monuments of natural and cultural heritage**, widely-spread in the region, are a basis for the development of tourism and recreation activity. Out of 12 objects found on the territory of Kazakhstan and included into the World heritage list, 6 are situated in the Ili-Balkhash region.

**D. The economic potential** comprises a developed agriculture with the total 8.18 mln.ha of arable lands. Natural pastures occupy 6.53 mln.ha of them. Poultry keeping and swine-breeding also take place in the basin. There are possibilities for fish-farming. Industry is based upon copper-bearing and polymetallic ores with the Balkhash mining and smelting and Tekeli lead-zinc plants functioning here. There are many branches of industry developed in the basin: engineering, metal-working, light, food and meat and milk industries, manufacture of home appliances, other types of production. Power industry, despite availability of coal, water and wind resources, is underdeveloped, with the Kapshagay hydroelectric station, a number of hydroelectric stations and a thermoelectric power station functioning in Almaty. The power is supplied from other regions. A net of transport communications is developed here. The Turkestan-Siberian main line and a net of railroads, linking the basin to Russia, Central Asia, Iran, China run through the region. A net of highways, communication, air service are developed here.

### **Current development issues**

1/5 of the country's population lives in the Ili-Balkhash basin, rural population makes half of it. The acting administrative-command IBB management system, inherited from the Soviet power, does not enable to efficiently use human potential and brings to growing social issues. They include low standard of living, decrease of population due to migration, high level of unemployment, increasing diseases rate and reduced life interval, low birth and high mortality rates, reduced food consumption per capita. Reduced agricultural production entailed reduction of working places and migration of villagers, especially of youth, to the cities. Serious social-economic and environmental problems in the region with significant resources available are, in many respects, a result of the inefficient management system, making it hard to attract large investments, because responsibility and authorities have been distributed between 15 Ministries and

4 oblasts here (Picture 1). Despite perspective stocks of mineral raw material resources, a powerful resource potential for hydro- and heat energy, the region has a number of economic development issues. Maintenance of the hydrological regime of rivers and water balance of the basin is decisive for interrelated economic, social and environmental issues. With the beginning of intensive water-management activities in the basin, by 1991 the total water consumption has increased almost 2-times and, accordingly, water flow into the lake of Balkhash has decreased. As a result, the level and area of the lake have decreased, littoral territories have degraded, salinity increased. The Ili-river has leveled its flow to the lake due to self-destruction which entailed environmental and social-economic consequences. Sustainability of the basin water balance depends on the volume of water, coming from the territory of China, since 77% of the Ili-river flow is being developed on the Chinese territory. If China takes 10-15% of water from this river, it may bring to the environmental disaster, similar to the Aral Sea one. There are works being carried out in the Chinese part of the Ili basin to transfer the flow to the Tarim river which has also turned shallow and is in a critical condition. As estimated, water deficit in China will be growing every year and will become the main inhibiting factor of the economic development of the region. Presently there is a Kazakhstani-Chinese group working on the issue of joint rational use of the transboundary rivers resources.

Construction of Kapshagayskaya hydroelectric power station created a lot of problems in the Ili-river delta which is a system of lakes, arms, channels, former river-beds, alternating with reeds, having a rich biological diversity. Its area has been reduced almost 2-fold, the flooding and watering mode of the lake systems has changed, there are only 5 lake systems left out of 16. All these resulted in loss of biodiversity and destruction of delta ecosystems with fatal consequences both for the environment and local economics. A big damage has been caused to fishery, fertility of flood-lands has aggravated, tugai forests vanished, yield of agricultural crops has decreased, production of fruits and vegetables has almost stopped. Change of the rivers hydrological regime and rearrangement of the surface flow is also linked to degradation of the basin catchment parts because of cutting-out of woods and fires. Further significant reduction of flow may take place due to melting of glaciers, caused by global warming, human and natural pollution. Melting of glaciers will enhance growing dryness of the climate and further desertification, which has already embraced about 1/3 of the basin territory. The economic activity, not taking into account environmental limitations, brings to pollution and destruction of the basin ecosystems. Ili and Balkhash are polluted with industrial wastes, domestic and drainage sewage which is one of the main reasons of the current potable water deficit.

There is no purposeful politics to develop alternative, resource-saving and environment-friendly branches of business such as tourism. The existing transport infrastructure is in an unsatisfactory technical condition and requires reconstruction. As a result, the rate of economic development in the basin has slowed down, industrial and agricultural production has decreased. Irrigated areas and their yield have been reduced. For 10 years, even after huge investments, the irrigated areas have been reduced 2-fold. This situation with flooding of pastures brought to a 3-fold reduction of sheep population. The net of enterprises, processing agricultural production on site, is underdeveloped. In the 60-s there were up to 30 thousand tons of fish caught a year, including up to 70% of valuable species, in the 90-s – 6.6 thousand tons a year, including only 4.9 tons of valuable species of fish. There is no activity organized to reproduce fish resources.

### **Introduction of economic nature management mechanisms**

In the last decade they started actively adding economic indicators to the information on natural resources in ex-Soviet countries. The economic appraisal was acknowledged to be a necessary link in the system of overall assessment of natural resources, enabling to include this type of resource into the sphere of economic activity. The economic appraisal is assumed to provide an unbiased picture of the economic value of natural resources, to enable to substantiate investments in their reproduction and preservation, to select the most efficient way to exploit them, and to improve taxation of some of them. In case of multiple uses of natural resources, the economic appraisal enables to more soundly choose the area where to use a certain resource and to define the strategy

of rational use of a natural potential of the territory on the whole. The use of economic instruments as payments or taxes for use of natural resources brings to the need to find out the value of these resources. Inclusion of indicators of value of natural resources into the development management process enables to assess the natural capital available and the level of its use as well as to coordinate the common economic politics towards a more efficient use of environmental-resource potential. But due to the current economic crisis, the estimates of natural resources in the region are very low. That's why it is necessary to develop the natural capital management politics, based on their functional significance and potential cost for future development.

It is possible to reliably protect the environment only through economic methods, particularly, through inclusion of possible environment losses, taking place due to the irrational nature management, into the product's prime cost. For this end, it is necessary to assess the affect on the environment and to find out a multiplicative effect from influence of various types and scopes of nature management. Development of an ecorent from resources of the basin territories enables to develop the economic models, based on the estimate of the natural capital in the framework of a single integral territory (Picture 2). The potential and possibilities to maintain services by ecosystems of the basin territories are directly dependent on the water resources. Even the stock of mineral raw material resources, located within the basin territory, enables to obtain a larger ecorent if there are enough water sources. With the help of the environmental-economic category of ecorent, developed at different levels, we may manage the nature management economics and, consequently, the sustainable development of the basin territories, if the ecorent determines the added value, developed based on the exploitation of natural resources. The resource-power budget is being developed under the influence of natural conditions for millions of years. At the moment of exploitation of a deposit the profit is also affected by the natural-climatic environment which is usually not included into the final product's prime cost. When exploiting a deposit, mineral raw material and carbohydrate resources, water and soil resources, when preprocessing and processing natural raw materials and up to the final technological stage at which the final product is obtained and turned into a product of physical deterioration, there is an associated nature management taking place. This entire process also includes environmental losses which are not being taken into account in the rent prime cost and product's price. Natural resources are running out and economics does not protect them or protects in a rather weak way through budget subsidies, invested into the environment preservation and always insufficient to address even a small number of issues. Inclusion of ecorent into the nature management process will enable to develop an efficient mechanism of pricing, providing for the compensation measures to protect and rehabilitate natural resources, supplying goods and services of ecosystems.

There are different methods to assess the cost of natural resources and ecosystem services in the world. The cost appraisal depends upon the type of resources and environmental conditions as well as on the role they play at different stages of public development. Until recently the ecosystem services were almost not being assessed. A monetary appraisal of natural resources served to optimize the centralized management and relevant allocation of resources for "rational" development. That's why we still do not have market mechanisms of assessment and use of natural resources and especially biological, periodically renewable resources. The offer and demand for these resources were being determined in the offices and not at the market where prices were really being developed. In the market conditions prices play the role of crucial indicators, especially when making economic decisions. They are the main indicators of territorial development, directly depending upon the possibilities and potential of natural resources which growingly include environmental conditions. But market prices for natural resources do not always provide an adequate appraisal of their value as objects of natural and cultural heritage. For example, the specially natural protected areas preserve their valuable biological and landscape diversity, being significant both for the country and humanity on the whole. However, when assessing the value of these territories, they are addressed as budget organizations without annual income. That is the value of natural capital of such areas and assessment of their functional potential, supplying material goods (biological diversity) and non-material services (clean air, water, aesthetic values) to

neighbouring territories and states on the whole is not taken into consideration. According to the existing system of assessment, the walnut grove or apple farm of a neighbouring forestry are more profitable than a territory with the ancestor forms of these walnuts and apples that can be found only in this country as well as a number of endemic species, destroyed on the neighbouring territories, and settlements of rare endemic marmots and the last populations of argali or snow leopard and other natural values in the world... Thus, when appraising capital in a monetary form, we face a paradox: the larger diversity of environmental, cultural and social objects, the lower value of this territory. Thus, the national wealth structure is distorted and, consequently, the efficiency of the social-economic politics, aimed at preservation and rehabilitation of natural resources and natural heritage, is going down.

The ecocentric approach in the assessment of a territorial capital and increased possibilities of monetary appraisal of natural resources and ecosystem services through their inclusion into the economic indicators enables to better adapt an assessment mechanism to the specifics of environmental conditions of the territory. This should also involve a different opinion of the essence of a monetary appraisal of natural resources and ecosystem services. Besides positive results of affect of small and large forms of management with traditional ways of housekeeping and relevant nature-conservative institutions and, consequently, ways of environment conservation in an isolated condition from the global economic system, there are losses taking place. The global market competition brings to the fact that countries with "a traditional economic behaviour", including that in terms of nature management, start lagging behind. The local nature-conservative standards come down due to the aspiration to obtain competitive advantages when launching industries, closed down in more developed countries. Monetary appraisal of natural resources only in the global market prices and expert subjective positions is not sufficient. This is explained by the fact that when assessing certain objects and services we should take into account the interests of sustainable development of local communities and settlements, tracing it with the help of human development indices. No one but consumers of the local resources can best of all assess the landscape where they live, using its natural resources and ecosystem services.

Introduction of the ecosystem approach in management of the Ili-Balkhash water basin in Kazakhstan for the first time applies in practice of the environmental preservation the notions based on appraisal of the natural capital. But the legal basis for such approach has not been developed yet, nor has a terminological foundation of sustainable development been developed. There are no measurable indicators of affect on the economics of the environmental preservation, no integrated indicators of the environmental condition in reports of the local administrative authorities. The economic efficiency of environmental preservation is not reflected in macroeconomics of the regions, and the environmental preservation is not realized as an economic instrument of the budget policy. Private capital, investors and local community are not interested in the improvement of ecosystems, either. Insufficient budget funds in many respects affect the inefficacy of preservation activities. And the system of environmental penalties and fees for use of natural resources almost has no feedback and is not used directly to support the environment-related activities. Lack of benefits and stimuli to develop the environmental business (e.g., partial exemption from taxes, favourable credits) does not enhance introduction of advanced innovations, environment-friendly and sustainable technologies. There are no mechanisms of overall support provided to the development and implementation of environmental projects. When planning, they are still interested in gaining an immediate profit and not in the strategic long-term development priorities. Environmental traditions of the past generations have also been forgotten, and new traditions of economy, healthcare, exactingness to food and water have not been developed yet. The intersectoral character of the environment preservation and administrative division into regions, not coinciding with the natural frontiers of ecosystems, bring to lack of integrated management and distribution of responsibility between different, often contradictory in their activities institutions. That's why there is no common interest in the improved basin ecosystem. There is no economic interest in the improved social factors such as health of the population, culture, education, etc. The social factors are not perceived as economic instruments of the budget policy. All these bring to

lack of direct investments of private capital in the long-term growth of incomes of budgets from the environment-related industrial and mediated economic effect of non-economic activity.

Presently the flow of services of natural resources is little due to their underestimated value. Implementation of the project on the development of an integrated plan of management of the Ili-Balkhash basin enables to correct the current nature-preservation policy in line with the goals of sustainable use of the environmental capital of the territory. At the first stage it is supposed to determine the cost of services of ecosystems in the development and direction of money flows in the economics, analysis of movement of money flows “environment – economics – environment” and assessment of the level and rates of exhaustion of the basin environmental resources, identifying the cost of services, provided by ecosystems. This will be done based on the economic appraisal of major natural resources at the basin level, estimated development of economics in the near 5-10 years and assessment of possible change of demand for the services of natural resources and the environment. The monetary appraisals of natural resources demonstrate their value and enable to reveal interconnections between the economic and environmental parameters, i.e., determine which effects for the condition of the environment will be produced by certain activities in the economic field and vice versa. When organizing nature management in terms of current sectoral management and imperfect market, it is important to pay attention not as much to increased extraction and search of new fields as to the economic order in water consumption, forest exploitation, use of mineral resources, proceeding from the crucial task of increase of social and economic profits from nature management.

#### **Development of the sustainable economic activity**

It is possible to address the issues of further sustainable basin development only with the radical change of existing economic activity under support of industries, providing simultaneous economic and environmental effect. They include branches, whose development is based upon sustainable use of ecosystems goods and services (tourism, fishery, hunting grounds, musquash breeding) and branches of environmental business (wastes processing, involvement of renewable power sources, forestry). The state needs to ensure support, encouragement of strong and competitive export-oriented branches, such as industry and export of cheap power, processing and production of environment-friendly agricultural production, fine-fleeced sheep-breeding and fur farming.

In the Almaty oblast there are unique possibilities to develop power engineering, able to satisfy consumers from the south of the country, to enter the power market of Central Asia and China. Support and encouragement of wind power engineering along with other sources can meet demand for power in case of unfavourable natural conditions. Wind power stations can be developed as a commercial direction of the trade market at emission of greenhouse gases in the framework of the Kyoto Protocol. The Strategy of power development in the Republic to 2030 mentions the Ili-Balkhash basin as a perspective site for the construction of small hydropower stations. All these steps can bring significant tax and currency inflows for the IBB development. It is perspective to transfer heat stations and boiler-houses, using coal, into gas and liquid fuel which will allow reducing emissions into the atmosphere and emission of greenhouse gases. According to specialists, streamlining of power management will 5-fold repay expenses for energy-saving, will reduce emission of wastes into the atmosphere by 15-20%. Industrial establishments of Kazakhstan consume 2-5-times more power compared to other developed countries. In 1990 the specific power intensity of GDP in Kazakhstan was almost 2-fold lower than the level of developed countries, and by 1995 this indicator has dropped almost 2-times. Assessment of the theoretical potential of power supply (about 20 mln. tons of standard fuel a year with full implementation of a set of organizational and technical activities) is commensurable with the existing and estimated deficit of power resources. Only the activities establishing order in the field of power management can save up to 10%.

The basin has a huge potential for agricultural development. Introducing corporate management, we may address the issue of employment, small, family and farm business, since

investors will find it beneficial to widely use efficient technologies. Under a relevant management system it will be beneficial to invest in small and medium business, engaged in the field of renewable use of ecosystem services, such fields of activity as maintenance of farms to grow seeds, planting stock, medicinal plants, cubs of new species of domestic animals, fight with hazardous insects and animals, distribution of know-how and licenses. Estimation of the effect from investments will allow switching from the resource- and power-consuming agriculture to growing of new profitable crops: wheat, beetroot, corn, vegetables and fruits. Their crop capacity may be increased with the introduction of modern technologies and modernized ways of soil cultivation. It is of importance to expand the areas of watered pastures and to restore forage reserves in deltas and valleys. A stabilized hydrological regime and improved water quality will enhance rehabilitation of spawning sites and development of fishery. It is supposed to nurture sturgeons and trout in lakes and ponds, to develop purposeful preservation of the gene pool of valuable fish species in Balkhash.

Reconstruction of a highway network, development of air services and river transport will allow improving the communications system and enhancing the development of sustainable tourism into a profitable branch of regional economics. The Government of the Republic of Kazakhstan in the long-term programme of development of Kazakhstan has specified tourism as a priority branch since it ensures the inflow of foreign currency, helps increase employment and enhances development of the country's infrastructure. Out of 10 priority regions, specified in the Concept of tourism development in the Republic, 5 are situated on the basin territory. The Programme also develops steps to protect the monuments of natural and cultural heritage from an excessive recreation load. The tourism development will be enhanced by optimization of an existing net of conserved natural territories, developed based on suggestions of public organizations and local authorities. Introduction of conserved territories will allow preserving and rehabilitating of the unique basin ecosystems and will ensure the sustainable character of goods and services they provide.

The review and improvement of economic and financial mechanisms, based on the inclusion of an environmental capital in the prime cost of the goods produced, is an important component of the sustainable development of the basin. Application and development of the ecorent approach will enable to take into account necessary environmental expenses to maintain the sustainability of ecosystems and preservation of biodiversity when developing taxes, customs fees and other mandatory payments (Picture 3). To work with donors and develop efficient economic and financial mechanisms, it is needed to review and assess the resources available, such as:

- Contemporary assessment of a resource-energetic potential of the basin;
- Assessment of tendencies of the environmental and demographic potentials;
- Assessment of the ecorent potential of Balkhash ecosystem, including the river network (introduction of the taxation system for use of water resources);
- Reassessment of basic funds of the productive forces in the region;
- Determining possibilities of use of financial-credit assets for the ecorent potential of the entire water basin;
- Substantiation of the integration scheme of sustainable financial-economic development of the IBB and Balkhash ecosystems.

The sustainable development of the basin will require significant investments. As roughly estimated, at the first stage of the programme (to 2010) it will require the investments of up to several billion US dollars. The sources of financing may come from the state, credit and private contributions as well as from funds received from pollutants and users of natural resources. The state contribution should be quite significant in the total amount (up to 1.5 billion dollars) which is necessary to maintain the sustainability of water resources and to run nature-conservation activities. As preliminarily estimated, private investments should make the same amount, out of which up to 1 billion will be invested by enterprises and up to 200 million will come from credit resources. The expenses required to address primary issues of sustainable development of the basin and to overcome consequences of the transition crisis make up to 0.5 billion US dollars a year, while investments into the basin do not exceed 50 million dollars a year. The above investments will

enable to 1.6-1.8-fold increase the gross product, to ensure employability, increase of production and food security, to address the issues of potable water supplies and rehabilitation of destroyed ecosystems. Naturally, no investor will be able to provide the funds required on his own. That's why there is a need in new mechanisms to attract funds, using, first of all, the available potential and national resources.

Together with the International Environment Financing Center, CAREC is implementing the project, financing the programme aimed to address the issue of potable water supply to villagers. This programme ensures establishment of a local financing system at the level of rural areas and oblasts to pay for maintenance of water-related activities, ensuring accessible and sustainable provision of potable water. The project implementation includes five stages.

1. Review and assessment of needs of villages in potable water, determined by the villagers, in particular, to prevent water-transmitted diseases. The oblast authorities, Akim's office of the Almaty oblast, carried out a preliminary assessment of occurrence of water-transmitted diseases in certain villages. This information became a basis for the water quality and health improvement strategy.
2. Assessment of paying capacity for provision of potable water at a rural level, assessment of cash that may be needed to maintain water systems and related operations and ability to pay for a part of exploitation expenses (10%) when purchasing and installing systems and possible spares for repair.
3. Finding technologies and funds: finding funds and locally applicable technologies at low expenses to maintain the systems is a prerequisite for their introduction. Estimated expenses for the water systems technologies ranged from \$38,000 to \$60,000 per village.
4. Support to the Water Committees, established in every village as NGOs, and their representatives, trained to work with the water-supply system. A village operator and district person in charge are responsible for daily operations and maintenance of the system.
5. Financing: funds to maintain the water-supply system are collected from locals, paying for spares and equipment, annual salary of the operator, part of the operator's salary and reserve funds to ensure repair and purchase of spares. The reserve funds are kept in a local Water Committee and provided from time to time to pay expenses related to repair and replacement of spares.

Thus, the issue related to the potable water programme in Kazakhstan can be addressed due to mobilization of internal resources. Each certain case determines its own mechanism. In case of reconstruction and installation of the potable water-supply systems, the issue has been addressed at the local level in several stages. First of all, funds were attracted from local communities through the awareness-raising campaign aimed to explain the necessity of payment for clean potable water, an elective water management committee was established, water-supply systems were constructed and reconstructed, financial cooperatives were established, ensuring the sustainability of operations, a self-maintained system, accurately functioning and timely reacting to changes, was established. The programme has a long-term effect, it is aimed to encourage introduction of similar mechanisms in small villages and towns of Kazakhstan through the development of a similar system of payment for resources and services and provision of clean potable water. Besides, such scheme of payment for potable water can be offered as a model for introduction in other Central Asian countries, too.

Financing of the environment presupposes establishment of a national sustainable self-maintained system, aimed at market needs to finance environmental projects. Sources of financing of such projects come from the national budgets, international financial institutions, donors and private capital. As far as the national budgets are concerned, the environment of each country has to compete for the limited budget funds with high priorities such as national defense, food provision, health, education and economic development. International financial institutions, represented by the World Bank and all the other regional development banks, do not have sufficient financial resources to provide clean water and clean air all over the world. All of them spend about 5 million dollars a year for the environment, while only to provide potable water it is required to spend over

25 million dollars a year. Donors also can provide only a small share of support in the environment-preservation issues, and in this case their limited funds are aimed not only at the environment preservation but also at other needs, such as education and healthcare. Only private capital can ensure funds, necessary to provide clean water and clean air for billions of people on this planet. We only have to find out how to make the private capital work for the environment. First of all, the private capital markets should be liquid and investments should be easily sold and resold. The liquid market is the only one with such investment opportunities. That's why, in order to be liquid, environment-financing programmes should be widely-implemented. Such programmes should be national, they cannot be regional or local. The liquid market is permanent because similar investments should be accessible every year. Such market cannot depend on annual legislative acts or provisions. In order to be permanent, environment-financing programmes should be self-sustaining which is possible in case of development and maintenance of national permanent financial programmes, ensuring the system of financing. Such system can attract a private capital. When financing high priority environmental projects, countries should have access to private capital markets.

Balkhash doesn't have a single management body, responsible for the condition of the entire basin and financially interested in obtaining a stable profit from sustainable balanced use of natural resources, in growth of a sustainable economic activity. Establishment of such a body in the framework of the project implemented by CAREC will allow shifting to the macroeconomic mechanisms of territorial management. Development of the provision on an intersectoral private-state joint-stock corporation to manage the basin, comprising key water users, investors, experts, environmental and other foundations as well as local communities, will enable to invest private capital into the development of entrepreneurship, infrastructure, social and environmental fields, liquidation of budget deficit. Only in this case it is possible to demonstrate the direct and indirect economic effect of environmental and social activities, which previously was not taken into consideration. To overcome legislative barriers, it is expedient to establish a special intermediate state foundation. A huge territory of the basin and Kazakhstan on the whole, with a low average density of population and concentration of productive forces, allow achieving high quality of the environment and making it attractive for investments, tourism and recreation. The environmental macroeconomic investments alone will have no effect if not invested into the entrepreneurial development, education, training, infrastructure development.

According to different estimates, with low living standards of the population, the total economic turnover is low for institutional reasons which can be removed in case of introduction of the ecosystem management. A large share in ceiling of an economic potential is caused by lack of support to the introduction of new technologies, with which it becomes possible to invest into expertise, certification, patenting, licensing of a diversified series of inventions, into training and professional development of inventors on terms of joint ownership of the future intellectual property. The most burning for politics issues of taxes and local authorities are also addressed on a contractual basis through introduction of territorial self-management and expanded autonomy of the administrative territory. If the established territory management corporation is able to provide financial guarantees of growing taxes to the republican budget, determination of the tax regime can be sent down to the local level. This is the only way to demonstrate the economic effect from simpler taxation and reduced tax rates. Thanks to the cross joint stocks with the Ili-Balkhash JSC, there can also be established an institute of joint-stock owners for increase of certain resources or local ecosystems – rivers, reservoirs, lakes, quality water, forest, rehabilitation of degraded soils, commercially sold animals. The owners should at their own expense ensure insurance of environmental offences and disasters (forest fires, mudflows, etc.).

### **Conclusion. Project implementation stages**

One of the main reasons of environmental problems of water basins and other large ecosystems is lack of a balanced resources management structure, controversial economic interests of environment-users, inability to assess and stimulate the economic effect from improved

environment. The Ili-Balkhash basin can demonstrate perspectives of development of the environmentally sustainable economic activity, based on sustainable use of environmental resources. Introduction of power- and resource-saving technologies, also being a key to fulfillment of commitments under the Framework Climate Change Convention, will enable to implement a clean development mechanism at the basin level. Solution of issues on a self-supporting and economically profitable basis, taking into account a contribution to the improved water and environmental factors, to the economical growth of the region will allow using the private financial and intellectual capital in the macroeconomic activity to ensure sustainable long-term growth of resources, and to gain interest rate from the growing commodity-money turnover, from tax proceeds of industries. A potential income from macroeconomic investments into the sustainable economic activity must be higher than the income from environment-unfriendly industries and technologies. The essence of transformations is in transfer to private investments in macroeconomics, in a long-term growth of money turnover of the basin territory, in elimination of the budget deficit, in the development of a quality legislative basis and any other activities, bringing no direct commercial effect but contributing to the improvement on the whole. These are fundamentally new relations between the state and private capital which did not exist in ex-Soviet countries.

Establishment and encouragement of the activity of local associations of environment users, water users, owners of private property, financially interested in the rehabilitation and conservation of local water and environmental resources, will in practice ensure implementation of the ecosystem approach and introduction of economic mechanisms in the IBB. The main results of introduction of the new economic politics, taking into account environmental limitations, is reduction of the irrational water use, optimization of the hydroengineering facilities activity, development of sustainable arable farming and sustainable use of biological resources. Proper economic planning will enhance preservation of the basin biological diversity, rehabilitation of the Ili-river delta and spawning sites, development of navigation on the Ili-river. An important component of the ecocent approach is the development of spaces of international environment-economic cooperation, free space of border trade, the system of priority types of a sustainable economic activity, identification and development of the most attractive fields for investments. Introduction of economic mechanisms in water use will ensure its efficient consumption in industry and agriculture and will enhance the development of “environmental” directions of activity (Picture 4). An assessment of the basin, its economic activity, industrial and agricultural losses in case of exhaustion of water resources and/or their pollution will allow defining the amount of taxes and funds, required to maintain the ecosystems sustainability and provision of necessary services for the sustainable basin development. But to stimulate such development, it is needed to improve legislation which will make it beneficial to transfer to the latest environmental technologies, introduction of power saving, wastes processing and nonwaste technologies. Hereby, it’s important to consider the experience of other countries where the development of environmental business is quite profitable. The ecosystem approach in the nature management economics is ensured by fulfillment of the following conditions:

- Use of environmental resources should be coordinated along with all the categories of branches of users (consumers) in the framework of a single basin unit;
- All the types of environmental resources (water, soil, etc.) must be integrated into a single management system;
- The community represented by nature users concerned should be involved in the decision-making process, related to resources management, which will ensure fair division and transparent activity of economic organizations;
- Financing of the upper link of economic systems down to the level of common users should take place both at the expense of state and private funds with further increase of the environment-users’ involvement as their income grows;
- The environment-users’ income should be sufficient so that they could fully pay expenses in exploitation and maintenance as well as small repairs and improvement of their part of the system;

- Conservation of ecosystems should be one of the major priorities in the economic bodies' activity.

It is possible to achieve these goals if we identify the role and responsibility of the government, hydroeconomic organizations and other parties concerned in the issues of management, use, development and protection of environmental resources. Finding out the social, economic and environmental value of natural resources will allow developing certain positions in terms of restructuring, authorities, privatization, increased role of local communities and involvement of environment-users. Hereby, it is important to determine the rights for environmental resources and set a coordination mechanism between the sectors. Experience that can be gained upon implementation of the present concept can be used to address social-economic and environmental issues of the Aral and Caspian Seas, basins of the Irtysh, Ural rivers and other reservoirs and ecosystems as well as for the strategy of sustainable development of the Republic of Kazakhstan.

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FIGURE 1

GRAPH OF ISSUES

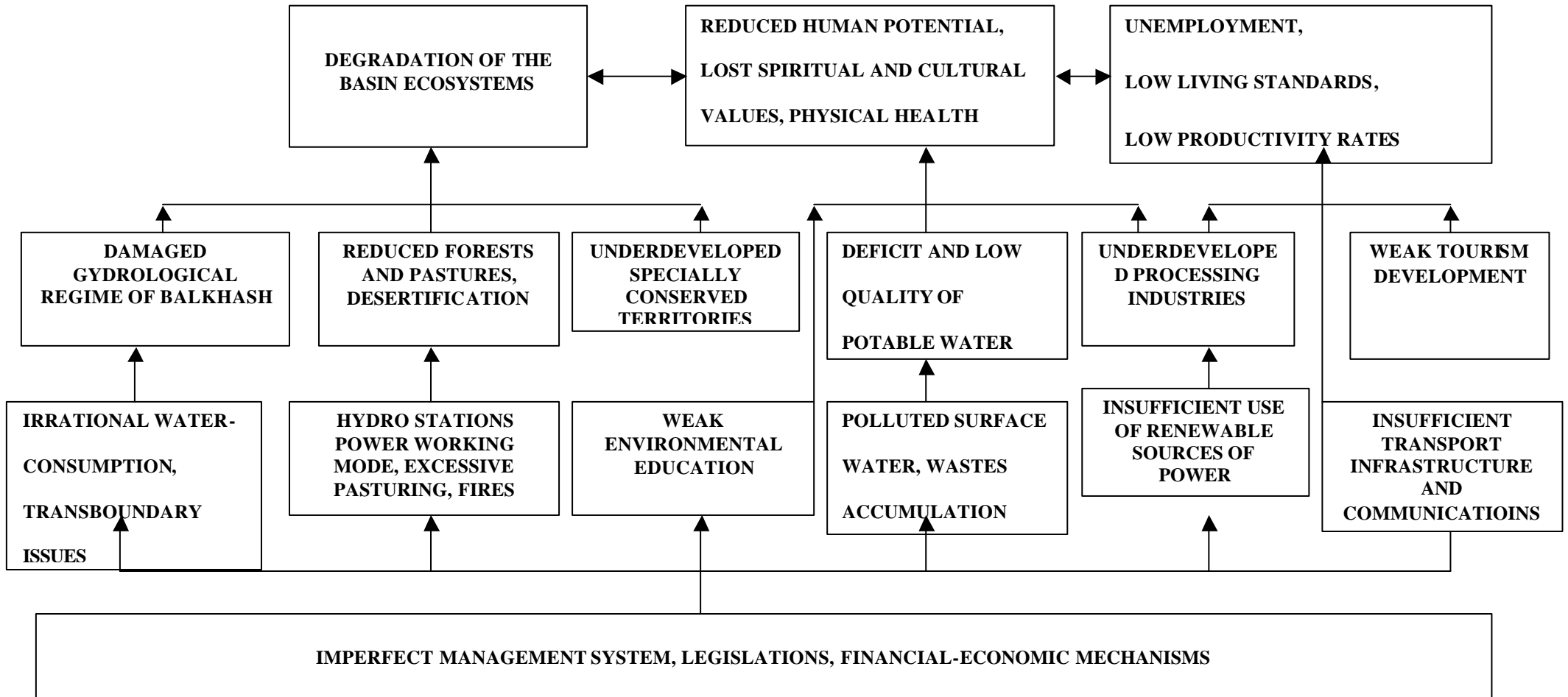


Figure 2.

## Natural and Ecological Rent Components

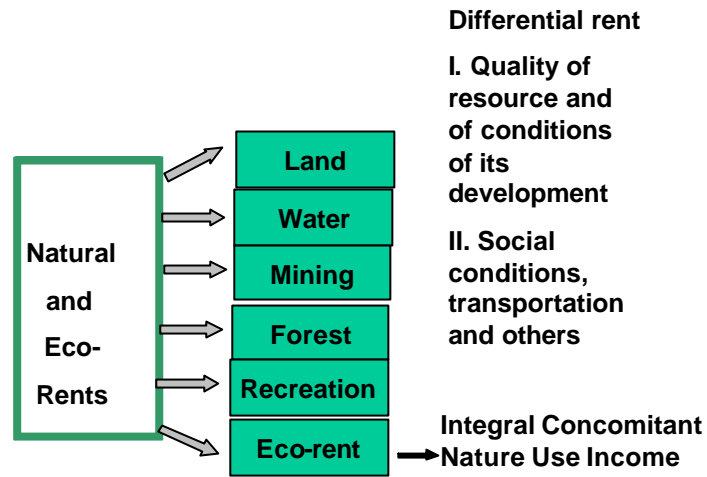


Figure 3.

## The product's price components

