



SEMINAR ON ENVIRONMENTAL SERVICES AND FINANCING FOR THE PROTECTION AND SUSTAINABLE USE OF ECOSYSTEMS

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ECONOMIC VALUE OF THE ECOSYSTEMS IN KAZAKHSTAN

THE KAZAKHSTAN EXPERIENCE RELATED TO ECONOMIC VALUE OF THE ROLE OF ECOSYSTEMS IN WATER MANAGEMENT

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Despite the country has not already scheme of payments for ecosystem services in place there are attempts could be use as a base on the issue.

In the Republic of Kazakhstan forests occupy 12.4 million hectares, or 4.6% of the country's total surface area. However, expert's calculation shows that the core timber alone is valued at 158.8 billion tenge¹ [at current rates, over US \$1 billion]. If we taken into account that this constitutes only 7.5% of the value of all of the forest's beneficial properties (including the production of oxygen and the absorption of carbon dioxide—that is, deposition of carbon), and also take heed of its water-conserving, sanitary and hygienic, soil-conserving, and other functions, the total worth of Kazakhstan's forests will equal 2.2 trillion tenge. The mean annual growth in timber alone is estimated at 2.5 billion tenge. Thus, the forest is a genuine national treasure; however, we are not dealing with this property wisely.

In their time, scientists in the East Kazakhstan region conducted detailed studies of the effects of logging on the hydrological regimes of rivers. The tributaries of the Irtysh, fed by water from several regions of Kazakhstan (East Kazakhstan, Pavlodar, Akmola, Karaganda), as well as from a number of regions in the Russian Federation, were investigated. At these sites, standard logging techniques were employed. The scientists concluded that as a result of logging, the river's water regimes had worsened. Thus, the average annual flow of the Bukhtarmy River fell by 567 million cubic meters, while that of the Uby River fell by 504 million cubic meters. Water erosion of mountain slopes increased significantly. This is the price of technology. At the same time, special research established that the effect of the soil-conservation functions of the forests alone exceeded the value of the timber by 16.5 times.

A sound approach has been proposed by Russian specialists called "Principles and Criteria for Sustainable, Environmentally and Socially Responsible Forestry and Forest Use in Russia". One related excerpt from this draft document is: "Economic activities in forests crucial from the standpoint of water conservation (regardless of whether areas with a special regime for natural

¹ Rational use of the beneficial properties of the forest—the basis for conserving and increasing its productivity, Valery Krylov, Consultant for the Ecological Society Green Salvation, Almaty, Kazakhstan, April 2004

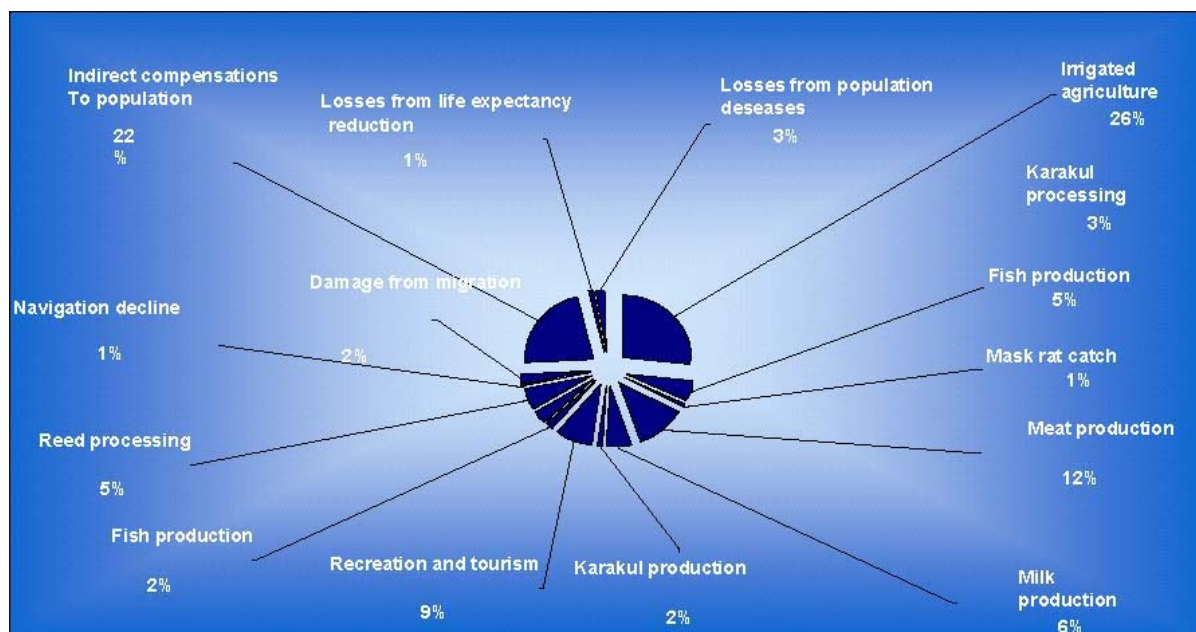
resource use have been distinguished there or not), should be aimed at the maximum conservation of the forest's water-conserving function. It is impermissible to remove these forests (or other lands within the forest reserve) for construction, the organization of auxiliary activities, or other forms of intensive economic activity...The permissible intensity for the removal of timber from these forests, should ensure the preservation of natural mechanisms, for support (restoration)...of soil microrelief, reserves of nonliving organic matter and moisture capacity in the soil and leaf litter, and a minimum level of technogenic impact on the soil and leaf litter.”

In result of two projects INTAS RFBR-1733 and INTAS Aral -2000 1059² implementation, social-ecologic damage has been assessed. Losses and their evaluation for Priaralie in amount of 160,63 mln USD/yr has been done.

**Elements of damage from ecologic disaster – Aral Sea shrinking
in Kazakh and Uzbek Prearalie, mln.USD per year**

Damage elements	Kazakh Prearalie	Uzbek Prearalie
1.Losses in agriculture, total	25,8	38,31
2. Losses in recreation and tourism	4,3	11,16
3. Indirect losses in industry	5	52,42
4. Reduction of the sea shipping volume	0,3	1
5. Social losses	14,1	8,24
TOTAL	49,5	111,13

Maximum damage in Kazakh Prearalie are connected with losses in agriculture - 27,2%, indirect losses due to compensation to population - 22,7% and meat production decline - 11,7% from total. Uzbek Prearalie has losses in fur processing - 18,4%, livestock - 11,9%, fish production - 11,8% from total.



Damage elements of from ecologic disaster – Aral Sea shrinking

² Economical assessment of joint and local measures for the reduction of socio-economical damage in the coastal zone of Aral Sea, SIC ICWC, Project INTAS-ARAL 2000 -1059, Tashkent, 2004

Prearalie is the zone of the most critical socio-economic conditions in Central Asia. Drop of the Aral Sea level has affected the development of pastures: decrease - from 1985 to 2001 - of watered pastures by 25% in Aralsk rayon and more than twofold in Kazalinsk rayon was resulted from the drop of groundwater level and the increase of groundwater salinity. Over pasturing on watered pastures promoted the reduction of yields and forage stock and the loss of biodiversity. Last decade due to abrupt increase of livestock production on Prearalie pastures a tendency has taken shape for restoration of pasture ecosystem capacities.

Changes in hydrological regime in the Syrdarya delta and lake systems of Prearalie have direct effect on the state of grasslands: by 1985-1991 their area had reduced almost 5 times, while yields decreased 4 times. By 1990, semihydromorphic ecosystems had been on the verge of disappearance. The increase of water releases and the reduction of anthropogenic load led to some stabilization of grassland; however, all-round intensification of solonchak development highly restrains restoration processes in delta ecosystems.

Flow regulation in the Syrdarya and Amudarya rivers and water intakes for agricultural needs have entailed drop of the Aral Sea level. Till recently fish industry had been one of the sectors of regional specialization, but currently it completely has lost its leading position and fallen into decay. Fish catch in the lakes of Syrdarya lower reaches started to fall down after construction of Shardara dam. At present only plaice is found in the Aral Sea. However, according to ichthyologists' data it is on the verge of disappearance since its hard-roe suffers from increased water salinity.

Currently only two lake systems, such as Kamyslybasskaya and Akshatauskaya and partially Aksay-Kuadarinskaya are significant in terms of fishery. However number of the main food fish – sazan and bream – has considerably reduced and number of roach, predators and rough fishes has increased in retained lakes. Fish and fish products are the main food and sometimes the primary income of local people.

Over many years people of Prearalie has been suffering from serious environmental and socio-economic problems and most of all from poor quality of drinking water. Fishery and paper industry, development of which was dependent on fish and reed as on raw material have disappeared thus leaving thousands of people without livelihoods.

The value of ecosystems is rarely accounted for in economic decisions. This is no surprise as there are no rules stating that and how these values should be included in economic calculations. The Netherlands is the first country in Europe to install a national guideline for monetarizing ecosystem values within cost benefit analyses. The Dutch guideline provides a systematic approach to prevent both over and under estimates of ecosystems' values. This new approach is applied to the ecosystems of the Schelt estuary in Belgium and showed that some ecosystems generate more Euros than they cost³.

An interesting feature of this Dutch guideline is the way in which it tries to prevent possible over and under valuation. The few valuation studies that had been conducted seemed to produce results that either completely overruled the costs of the project being appraised, or that were absolutely negligible compared to the project costs. On the one hand, policy makers felt that studies concluding that ecosystems are much more valuable than any economic activity, could not be right and were not helpful to make decisions on planned economic activities. On the other hand, they felt that studies concluding that ecosystems' values are negligible were not really helping much either. It thus seemed that the results of valuation studies are perceived as either too high or too low to play a

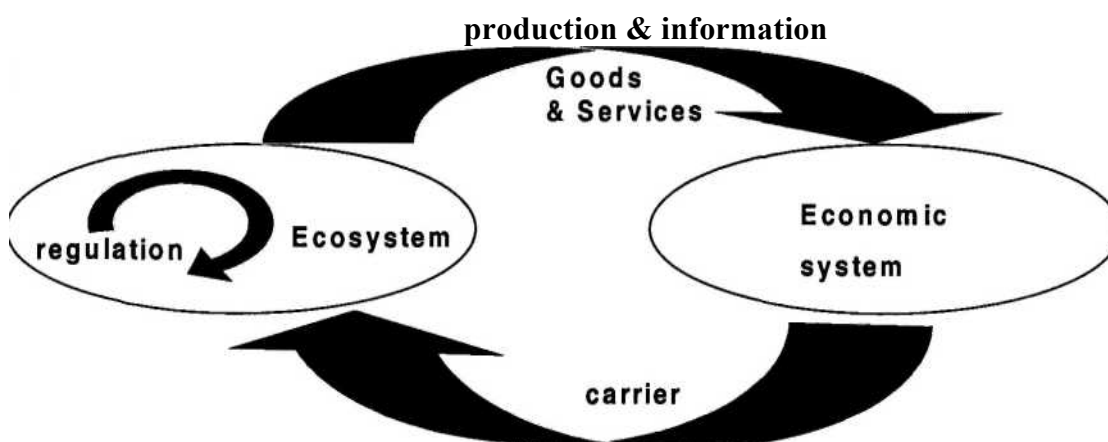
³ Blending ecology in actual economic decisions: The Dutch guideline for ecosystem valuation applied on the Schelt estuary in Belgium. Dr.ir. E.C.M. Ruijgrok, Witteveen+Bos, Rotterdam, 2005

role in cost benefit analyses for concrete political decisions.

This raised the question of why some studies produce such high values and others such low values. The Dutch guideline shows that this phenomenon of over and under valuation is caused by overlap or omissions in the welfare functions that are valued. In this article, it is shown how the approach of the Dutch guideline may help to prevent overlap and omissions by means of a concrete application in Belgium for the national decision on flood protection.

The functions of nature approach, which distinguishes production, information, regulation and carrier functions, was originally developed by ecologists to identify the substance and energy flows between the ecosystem and the economic system. The approach was applied by both ecologists and economist to determine the economic value of ecosystems, even though it was not meant for this purpose. Figure below shows how the different types of functions form a link between the ecosystem and the economic system.

The functions that ecosystems fulfill for the economic system



Judged by the magnitude of the ecosystem benefits, it is concluded that the estimated ecosystem benefits in this study are discriminating between alternatives. They do not completely overrule the costs, which would probably render them useless for the political decision making. At the same time the ecosystem benefits are not too small to support certain investments in nature development. In other words: from the case study we can conclude that an application of the approach of the Dutch guideline, resulted in a realistic value estimate that was not only useful to but also actually used in a national political decision.

Clearly, at the national level, achieving target 10 of the MDGs will require investments – in both hardware and software. Despite the obviously critical nature of the specific hardware and software ingredients, UN MDG’s Project Task Force on Water and Sanitation⁴ has focused its thinking on some of the less obvious policy decisions that must be taken if the ambitious targets are truly to be achieved. These national policy decisions have been crystallized in propositions, and first one is: “National governments—including planning and finance ministries and their supporting agencies—must be convinced of the importance of achieving the MDGs in water and sanitation. They need to recognize that water and sanitation are essential for the success of all development”.

⁴ Achieving the Millennium Development Goals for water and sanitation: what will it take? Interim Summary Report, Task Force on Water and Sanitation, Millennium Project, December 2003

Arguments in support of expanding access to water and sanitation services have been expressed in the language of *human values*; have been founded on the notion of a *human right* to basic services; and have also been made in *economic* terms.

The Kazakhstan experience related to economic value of the role of ecosystems in water management shows the way to improve ecosystem services are being essential for human beings, especially in the framework of IWRM.