International Fund for Saving the Aral Sea

"Programme of concrete actions on improvement of environmental and socio-economic situation in the Aral Sea Basin for the period of 2003-2010" (ASBP-2)

Dushanbe-2003

DECISION
Of the Board of the International Fund for saving the Aral Sea

August 28, 2003 Dushanbe

2. About the approval of the "Action Program on improvement of ecological and socio-economic situation in the Aral Sea Basin for the period of 2003-2010"

1. To approve the "Action Program on improvement of ecological and socio-economic situation in the Aral Sea Basin for the period of 2003-2010" (ASBP-2) prepared with the participation of all IFAS state-founders.

2. The Executive Committee of IFAS should ensure the coordination of work on this Program jointly with ICWC and ISDC and inform the Governments of the States and the IFAS Board about the process of its realization.

For The Republic of Kazakhstan	**A. Ryabtsev**
For Kyrgyz Republic	**B. Mambetov**
For The Republic of Tajikistan	**K. Koimdodov**
For Turkmenistan	**T. Altiev**
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CONTENT

I. Introduction

To overcome the ecological crisis and to improve the socio-economic situation in the Aral Sea basin is recognized by world community to be one of the greatest catastrophes of the XX century, the Heads of the Central Asia Governments in year 1993 created The International Fund for Saving the Aral Sea (IFAS).

In October 2002, the Presidents of the Republics made a decision to launch a new programme under IFAS. They stated basic directions and entrusted Executive Committee of IFAS together with ICWC and ICSD to develop "Plan of Actions for the Period of 2003-2010 on Improvement of Environmental, Social and Economic Situation in the Aral Sea Basin" under agreement of The Governments of participating countries.

II. General Information about the Aral Sea Basin

Longstanding cultural, economic ties and territories with the similar environments consolidate Central Asia countries. The area is shaped by highest mountain ridges of Pamirs and Tien Shan, vast deserts and steppes, and large Asian Amu-Darya and Syr-Darya rivers, inland lakes as Caspian and Aral Seas.

The region is rich with its mineral and energy resources such as oil, coal, natural gas, uranium, gold and etc. The countries are at the stage of transition to market economy and growth of economic indexes. The improvement is observed in agriculture, transport, mining and other sectors of economy.

Central Asia countries are situated in unified environmental space of the Aral Sea Basin. Ecosystem of the region is very vulnerable to man-made impacts because of arid conditions. Extensive method of economic activity and significant population upsurge promoted occurrence of numerous regional environmental, social and economic problems, including global scale catastrophe as Aral Sea tragedy. Dependence of region development on water storage and land resources exists from times immemorial. Basis for life in this area always was agriculture and livestock farming. Water therefore was the limiting factor.

From 1960 to 1990 large-scale programmes on land developing were implemented in the Aral Sea Basin. The result of the implementation of these programmes was twice increase of both irrigated areas and draw off discharge. Consequently, water flow into the Aral Sea decreased and in 2002 water-level lowered more than 21 meters. At the same time water-surface area was shrunk more than three times.

Annual negative profits in the region is around some billion dollars on

account of changes of climate, hydro chemical characteristics of water bodies, reducing of fishing in The Aral Sea, degradation of more that 4 million hectares of land and deterioration of biodiversity.

The consequences affected more than 5 million people living in Amu-Darya and Syr-Darya river deltas. Declination of living standards and worsening of state of health was observed. First victims of environmental crisis were the most vulnerable groups of population such as children, women, needy population of the Aral Sea area.

III. Review and analysis of implemented projects and programmes in the region over the period from 1994.

One of the basic direction of IFAS activity is informing international community about disastrous situation in The Aral Sea region and to find financial support for implementation of social, economic and ecological programmes in the region.

In January, 1994, top authorities of Central Asia countries adopted "The Programme of Actions for the nearest 3-5 years on improvement of environment situation in the Aral Sea Basin taking into account social and economic development of the region (basic directions)" (PBAS-1).

UNDP, UNEP, the World Bank, GEF, EBRD, ABRD, TACIS, German Fund, Kuwait Fund (EBRA), USAID and other international organizations together with experts and scientists from Central Asia countries took part in preparation of the Programme. The basic OBJECTIVES of the Programme were the following:

- Stabilization of environment situation in the Aral Sea Basin;
- Rehabilitation of disturbed ecosystems of the Aral Sea region;
- Improvement of methods of water and land resources control in the basin;
- Establishment of administrative structures of all levels for planning and implementation of actions of the Programme.

Measures in the framework of the Programme were divided into 2 stages. Duration of the preparatory stage was identified as 3- 5 years with financial support of 30 million $ USA. The period of 10-15 years were fixed for implementation of the second stage. The cost of the second stage were valued at 500-570 million $ USA. The Programme included eight components based on project concepts.

After implementation in 1997 of the basic part of actions of the preliminary stage, Central Asia countries and International organizations-donors of the Programme, conducted the joint review of the running state of Programme implementation and recommended the following actions to

be implemented at the second stage:

- to focus attempts on implementation of quick-response-projects for the purpose to receive powerful backing from Central Asia countries;
- to identify the most obvious results of the projects;
- to develop on country and region levels a coordinated policy and plans of actions on water and natural resource management as an object of reduction by 15 per cent of water quantities diverted from Amu Darya and Syr Darya;
- to strengthen activity with community and population, to create conditions for improvement of the policy in this direction.

At the same time, analysis of Programme implementation is evidence of the fact, that the basic limiting factor of foliature in complete implementation of a number of programmes and projects is not only lack of financing, but inadequate level of intersectional coordination and poor control of project implementation by IFAS executive bodies.

At present time all interested parties make efforts ton overcome crisis:

Strategic Plan of Development of the Republic of Kazakhstan up to 2010, The State Programme on Decline of Poverty Level in RK for the period of 2003-2005, National Plan of Actions on Hygiene of Environment (NPAHT), State Programmes "Population Health", "Portable Water", "Education", "Science", "Healthy Lifestyle", demographic policy and many other sectoral programmes have been adopted and are implemented in the Republic of Kazakhstan.

The long-term strategy "Complex Fundamentals of Development of Kyrgyz Republic up to 2010", National Strategy of Poverty Decline, Conception on Transfer of Kyrgyz Republic to Sustainable Development up to 2010, "Manas" State Programs on health protection, education, environmental protection and sectoral programmes have been developed, adopted and are implemented in Kyrgyz Republic.

In Tajikistan different programmes have been adopted and are implemented. Among them are the following Programmes: The Medium-term Programme of Overcoming Crisis in the Agroindustrial Complex of the Republic of Tajikistan and priority directions of the strategy of development of its sectors for the period up to 2005, State Programme on Environmental Protection up to 2006, National Programme of Actions against Desertification, Strategy of the Republic of Tajikistan up to 2005 on Health Protection of Population, National Programme "Pure water and sanitation in Tajikistan", State Environmental Protection Programme, National Programme on Decrease of Risk of Natural Disasters and Emergency Situations, The Programme "Tajikistan Youth", The

Programme of Development of Cotton-growing in RT for the Period of 2002-2005, EBRD Strategy for Tajikistan for the period of 2003-2005, National Plan of Actions for the Republic of Tajikistan on Decline of Effect of Consequences of Climate Change.

In Turkmenistan the following programmes have been adopted and are implemented: The Strategy on Social and Economic Reformation in Turkmenistan for the Period up to 2010, National Program on Environmental Protection in Turkmenistan, National Program on Improvement of Social and Economic Situation on the Close to Aral Sea-Territory of Turkmenistan, NEAP (National Plan of Actions on Environmental Protection), The Programme of Actions against Desertification, The Strategy and Plan of Actions on Biodiversity Protection, The State Programme "Health" and a number of other sectoral programmes.

In Uzbekistan the following programmes have been adopted and are implemented: the National Programme of Sustainable Development of the Republic of Uzbekistan, The State Programme of Tourism Development, The National Plan of Actions on Hygiene of Environment (NPAGE), The Programme on Aral Sea (The World Bank/UNDP/UNEP), The National Strategy and Plan of Actions of the Republic of Uzbekistan on Preservation of Biodiversity, The Sub-regional Plan of Actions against Desertification in The Aral Sea Basin (SRAPCD), The Programme of UNDP and the Government of Uzbekistan on Environmental Protection, The National Programme on specialist training and many other national programmes and projects.

The survey under the project "Assessment of Social and Economic Consequences of Environmental Disaster - Shrinkage of the Aral Sea" is continued. Factor initiating degradation of natural complex of near-shore area of The Aral Sea have been identified and analysed. The categories of social, economic, and also direct and indirect losses have been determined. Preliminary calculations of losses and their estimation have been done. On the basis of achieved results the project "Integrated water control for creation of water and marsh land in Amu Darya delta" was granted (together with Holland Resource Analysis Firm) under NATO Programme "Science for Piece" and is implemented.

The survey on the UNDP project "Development of the Potential of The Aral Sea Basin" has been completed. Model instrument on the basis of interaction of water resources, social and economic development and nature management in Central Asia countries for training and use by decision-makers was created taking into account results of the survey. Different

scenarios of region development up to 2030 have been calculated on the basis of the above-mentioned model.

Water resources

Water is a key problem in Central Asia. It becomed more acute at present time. Social, economic and environmental consequences rank as the most complex in Aral region. Differentiation of season water and energy demands as well as their unbalanced distribution create conflict preconditions and can significantly influence on economics of Central Asia countries.

Despite of reduction of water diversion quantity in the late 90th, the effectiveness of utilization of water resources is inadequate and complicated because of poor water system management.

To solve above-mentioned problems in the Aral Sea Basin a number of regional and National programmes covering different fields of conservation of water resources and environmental protection have been and are implemented:

- "Basic principles of National and regional strategies of water system management";
- "Management of water and land resources " (EC TACIS);
- " Management of water resources and environment in the Aral Sea Basin" (GEF);
- "Water and energy resources conservation in Central Asia SPECA" (UNECE);
- "Improvement of management of natural recourses in Central Asia Republics" (USAID);
- "Pure water and sanitation";
- "Rehabilitation of water and marsh lands in delta of Amu Darya river";
- " Regulation of Syr Darya river and North Part of the Aral Sea SYNAS"(WB);
- "Creation of a system for prediction of snowmelt flow for rivers of the Aral Sea Basin" USAID;
- "Hydrologic system control in the Aral Sea Basin, Aral-HYCOS";

However, detail review showed that the following projects specified in the Programme of Actions have not been implemented:

- "Development and introduction of uniform information system of water-resources assessment and water management";
- "Development of principles of improvement of quality of water resources";

- "Conducting water-management and environmental surveys on improvement of conditions in the zone of water flow formation ".

Mountain ecosystem

Current state of mountain ecosystems is characterized by complex social and economic problems. Principle of unreasonable nature management prevails. Stable degradation of mountain and forest ecosystems is observed even in under-populated regions of North Tien Shan.

One of the most important tasks to be solved is water conservation in zones of its formation and water flow recovery in mountain ecosystems. These systems together with water basins and glaciosphere represent united ecological system of the region. It is undoubtedly, that an important stage for conservation of mountain ecosystems is developed strategy on "Regional collaboration in the field of sustainable development of mountain ecosystems in Central Asia" (ABRD). The main priority of this strategy is preparation and coordination of combined surveys and monitoring of mountain territories.

Land degradation

Problem of land degradation is conditioned by both nature-climate factors and man's impact. Significant part of land resources is decertified. It is caused by change and loss of vegetation, sand deflation, ablation and wind erosion, salinity and contamination of water and soil with industrial and household wastes, pesticides and etc. These factors are causes of change of soil functions and decrease of its natural and economic importance.

National and regional programmes on desertification control are developed in Central Asia region:

- "The map of man-made desertification in the Aral Sea Basin"(1: 250000);
- "Natural resources management with participation of local population";
- "Support of the National Programme on desertification control of private agriculture in Takhta (Dashoguz)".

Biodiversity conservation

The major part of the region has changed as a consequence of man-made activity (disafforestation, water deficit, irrigation, steppes ploughing up and etc.) Decrease of number of flora and fauna species, collapse of tugai forests in Aral near-shore zones is far from complete list of all these changes.

It is necessary to acknowledge inadequate development and current state of legislation on conservation of nature resources. It can be explained

by lack of unified well-grounded scheme of ecological standards for the whole region.

The project on this direction titled "Development of eco-network as a base for long-run conservation of ecosystems in Central Asia" is developed in the region. The main task of the project is to elaborate eco-regional scheme of development of particularly conserved native territories (PCNT) in Central Asia countries.

The following regional and National Programmes on conservation of biodiversity and widening PCNT are implemented at present time:

- "Conservation of biodiversity in West Tien Shan" (GEF);
- "Combined conservation of water and marsh lands as migrant birds ecotopes" (GEF);
- "Conservation of saiga and its biotope on the routes of migration, places of wintering and summering (estivation)" (GEF);
- "Conservation and recovery of bukhara deers" (WWF);
- " Conservation of important Asian water and marsh lands and migration corridors needful for cranes and other globally significant migrant waterfowls" (ICF, UNEP);
- " In-situ Conservation of mountain agrobiodiversity " (GEF).

IV. Analysis of current status and tendencies of changes in the Aral Sea Basin

Social and economic situation

Social status of population in the region

Post-Soviet period in Central Asia countries was characterized by deep economic and environmental crisis and continued deterioration of main social indices. The most important problems are poverty (especially in rural area), population growth, high rates of morbidity and unemployment. Alarm tendency to reduction of life expectancy is observed.

Poverty is a problem impeding development of countries of the Aral Sea Basin. In 1999 more then 40 per cent of population in Central Asia was under poverty line.

The Governments of the countries make actions on rise of population incomes, reform in agriculture sector, implementation of employment and job creation programmes, development of infrastructure in rural area. Conditions for development of small and medium business are formed (Uzbekistan, Tajikistan, Kazakhstan), Programmes and Strategies on lowering poverty and unemployment rates are implemented in Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan. Since January 1993, Turkmenistan population is supplied with natural gas, water, electric

power, salt on free of charge basis. Fares for transportation and public utilities (heating, sewage system) are kept at a low rate.

Low level of social protection of vulnerable groups of population, inadequate position of women, youth and people of pension and pre-pension ages at labour-market is common characteristics of most of countries. At the end of 2002, women among all people looking for a job were 53 per cent in Kyrkyzstan and Tajikistan, 60-64 per cent in Kazakhstan and Uzbekistan. In 1999 the ratio of young unemployed people (at the age of 29-30) was 30-36 per cent in Kazakhstan and Kyrgyzstan , up to 60-62% in Tajikistan and Uzbekistan.

Population health

Population health was changed for the worse in Aral Sea Basin because of Aral Sea eenvironmental problems including water contamination and air pollution, lack of portable water, low sanitation level. The latter is an issue of the day in the Aral Sea Basin and neighboring regions. The maternal and infant mortality rate in epicentre of the disaster zone is one of the highest in CIS countries. Decrease of life expectancy, high rate of tuberculosis, anemia, cancer, asthma, dysfunction of thyroid gland, blood-, heart-, kidney- and liver-diseases cases are observed. This leads to worsening of genofund.

The situation is aggravated by inadequate prevention measures, morbidity monitoring and inaccessibility of necessary medicines in close-to-Aral-Sea region.

Portable water supply

The majority of population living in irrigated areas of Central Asia drinks water from irrigation canals. This water contains different salts, remains of pesticides, fertilizers, nitrates, excrements of domestic animals and other wastes of farming. Poor quality and lack of portable water is direct and indirect cause of many diseases and infections.

The following factors affect quality and accessibility of water used by population as drinking water:

- man-caused pollution of water resources;
- deterioration of networks and facilities of water and sewage systems;
- poor mechanisms of water payment and tariff system for water.

Situation with portable water supplying in Aral Sea regions of Uzbekistan is also a problem. For example, only 58,8 per cent population of he Republic of Karakalpakstan is supplied with water from pipelines. From 24 to 100 per cent of tap water in The Aral Sea Basin is inadequate quality and do not meet standards to portable water.

The problem of supplying Kazakhstan population with portable water

in the Aral Sea Basin has not been solved yet. Only 28-30 per cent of rural population is supplied with water from pipelines, 15-18 per cent of population takes water from decentralized sources of portable water, the rest population uses delivered water and water from reservoirs or tanks.

Environmental situation

Irrational economical activity in the Aral Sea Basin has led to extensive breakdown of ecosystems.

Degradation of mountain ecosystems

Mountains are exposed to both natural cataclysms (earthquakes, mudslides, avalanches, mudflows, floods and etc.) and man's impact (disafforestation, over- pastures, inadequate economical activities and etc.). Out-of-control tourism and hunting also cause damage to unique regions of mountain ecosystems.

In consequence of unregulated man-made impact on mountain ecosystems the following changes are observed: replacement of natural dominants of plants, depletion of genofund of flora, soil degradation, replacement of useful species of plants to weeds, deep changes of hydrothermal state of mountains, increase of probability of natural spontaneous disasters, desiccation, including glaciers.

Pollution of water bodies

Basic pollution source for water bodies of the region is collector, drain, industrial, municipal waste water.

Annually 33-35 km? of high mineralised and insufficiently purified collector-drainage, industrial and municipal wastes dump in the Amu Darya and Syr Darya rivers.

Recently the serious problem is a threat of pollution of water sources by radioactive and toxic wastes.

Crisis of Aral Sea region natural eco-systems

For past 40 years process of desertification has captured more than 4 mln. ha of lands, and the landscapes contiguous to deltas of the rivers of Amu Darya and Syr Darya have undergone to the most intensive influence.

Basic reasons of Aral Sea region eco-system degradation:

Natural: aridity of climate, natural supplies of salts in deposits of alluvial plains, deflation, land erosion, salt-dust transfer from drying bottom of the Aral Sea and others.

Anthropogenous: Pollution of soils by agro-pesticides, secondary salinization, monoculture and пover-compression of soils, removing humus, wastes of cattle-breeding farming, pollution of farmland industrial by domestic wastes and dumping the non-purified waste and collector-drainage

waters, over-pastures, cutting down of forests.

Irrigation-melioration wastes: dumping of non-purified wastes and collector-drainage waters in water sources, growth of concentration of salts in the rivers and reservoirs used for spray of agricultural cultures and others.

Loss of biodiversity

The progressive anthropogenous pressure (in particular, anthropogenous transformation of vegetative communities, fires, cutting down of trees and bushes, intensive pasture, and hunt) has resulted in infringements of biocenotic connections in natural eco-systems. The overwhelming majority of rare kinds of region flora and the faunas have appeared on the verge of their disappearance, others - already have disappeared.

Pollution of atmospheric air

The basic sources of air pollution.

Stationary: the emissions from the industrial enterprises and objects of power into air include more than 150 names of harmful substances. The serious threat for health of the people and environment is represented by group of chemical compounds known as persistent organic pollutants (POP), pesticides, the industrial chemical compounds such as hexa-chlorine-benzene, PCB, and also no-purpose secondary products - dioxin and furans concern.

Mobile: Basic pollutants in transport sector are nitrogen oxide, carbon oxide, hydrocarbons, benzopyrone, aldehydes. Use of leaded gasoline causes the high levels of the lead content in air that negatively influences on health of the people, especially of children. About 90% of lead wastes into atmosphere are occurred due to vehicle.

Natural: The basic sources of pollution into atmospheric air of natural character are the Karakum and Kyzylkum deserts, and also drying bottom of the Aral Sea. Annually 43 mln. tones of salts is transferred from the Aral sea basin and precipitated on the area 1.5 - 2.0 mln. km2 that has the significant damage to the close located agrarian regions.

Hydro-economic situation

The Aral Sea basin has large water and power resources, but their distribution by territory is non-uniform.

With the purposes of the decision of problems of water resources management in the Aral Sea basin the large reservoirs and hydrosites were constructed by the states of Central Asia. After acceptance of the

sovereignties a number of measures was accepted. In 1992 the Interstate Coordinating Committee on Water (ICWC) has been created. The executive bodies and the basin water-economy associations (BVO) have been included into the ICWC ("Amu Darya" BVO and "Syr Darya" BVO). The ICWC carries out the development of regional water policy, approval and maintenance of water limits by states and development of work regimes of reservoirs and hydrosites. Also, the ICWC operatively solves the problems on non-conflict water distribution, organises the water saving in transboundary waters by correction of limits, monitoring and information exchange on the base of regional information system.

At the same time due to imperfection of legal and normative base for the executive bodies of ICWC, distinctions of interests of the states on water use and weak technical equipment of BVO objects by facilities for water measurement and non-sufficient control the accepted decisions were not always carried out in the specified volumes and terms.

Main hydro-economic problems of Amu Darya are concentrated in lowers, which suffer from sharp shortage of water per usual or droughty years, insufficiency of a drain for maintenance of swamp eco-systems and of natural zones and for restoration of a part of the Aral Sea. Despite of undertaken efforts on distribution of water resources between the consumers it is not possible to avoid completely the disproportions of water consumption even within the framework of one country, especially between middle and under current of Amu Darya. It requires the development of the effective mechanisms and rules of management, which take into account the loss of a drain and which directed on maintenance of steady distribution of water, including ecological drawdown between control alignment and irrigated systems especially in shallow years.

Four coastal countries accepted the agreements on annual division of water resources in basin of the river Syr Darya, and also on limits of water intake from each channel. These limits are corrected depending on actual annual water capacity, if the drain appears below average norm. Thus, basically contradictions in distribution of water are absent, but there are disputes of practical character because of non-accuracy of the forecasts and measurement, and also absence of clearness in work of reservoirs. The practical assistance to equip the BVO bodies by facilities such as mechanical, water measurement and communication equipment is required.

With purpose of provisions of balance between energy needs of Kyrgyztan and irrigation requirements of lower countries in 1998 the Framework agreement on use of water and energy resources of the Syr Darya River basin has been adopted. Since then water drawndown from

Toktogul dam meets to needs of consumers from lowers, and Uzbekistan and Kazakhstan provide Uzbekistan with fuel.

The significant volumes of water from Toktogul in winter time reach the Shardarinskii reservoir, however below on current the Syr Darya can not pass such amount of water because of ice jams. In result, large volumes of water (more than 30 km2) have collected in Arnasai hollow in Uzbekistan. The damage to grounds and populated areas of Uzbekistan is caused, thus a lot of water is lost, which could be sent to the Aral Sea. The World Bank has given a loan to Kazakhstan to help in the decision of this problem, and also for stabilization of a part of the Northern Aral.

More then 51% from total volume of return water take off into rivers by collectors; about 33% - into lowers. And due to pollution only 16% of return water is reused for irrigation. Because of lack of the legal base the ICWC did not yet get the control of quality of transboundary waters.

In region on a base of collector-drainage and wastewaters a few hundreds of reservoirs with different volume have been constructed. It needs to note among them Aidar-Arnasai lower with volume of more 30 km3, Sarykamysh with volume about 20 km3, Dengizkul, Solenoe, Sudochie and a number of less capacious ones containing up to few millions cubic meters of water. It is necessary to renew the construction of the right-coast route for taking aside of salt waters from lowers into the Aral Sea.

The area of irrigated lands of the Central Asian countries in basin of the Aral Sea is about 8 mln. ha, and more then 5.0 mln. ha of them are undergone to salinization and different kinds of erosions.

In connection with infringement of agro-technical measures, the sharp deterioration of a technical state of irrigation-drainage systems and melioration state of lands the decrease of efficiency of irrigated lands and spray water are observed.

The tendency to growth of irrigated lands areas with close level deposition and high mineralization of ground waters, salinization, erosions and land degradation as well as non-productive losses of waters at fields are increased.

The construction of artificial drainage is required for 5.5 mln. ha of irrigated lands. The works on land drainage have been stopped. The repaired-rehabilitation works have been decreased at all parts of drainage systems.

At the same time, the problems of improvement of irrigated state of lands and rational use and water resources protection require urgent measures on rehabilitation of availability of present irrigated systems and drainage network.

Because of long terms of operation of dams and reservoirs there were changes of their parameters and statuses; stability and reliability of structures have been decreased. The majority of dams of region require urgent measures on increase of their safety. Within the framework of the Project on water resources and environment management (WEMP) the pilot projects on restoration and modernization of dams have been prepared. It is necessary to continue these works on the especially important priority objects.

Because of excessive cutting down trees and bushes in a zone of formation of a drain the negative processes - floods, mudflows, landslips and shallowness have been increased. The opportunities to adopt the salt resistance and quick cultivated trees as a biological drainage on underflooded and salted grounds do not use. There is a significant potential for development and restoration of forest fund in a zone of formation of a drain and deltas of the rivers Amu Darya and Syr Darya.

Environment monitoring

Regional network of environment monitoring reached the maximum development in the middle of 1980 years is significantly decreased now.

The vast territory of the Aral Sea basin has been not completely investigated by the meteorological observations. The density of meteorological network is 0.12-0.90 items per 1000 km2.

Observation hydro-meteorological network of region is equipped by outdated equipment and communication. The lack of meteorological observations in high mountain zones does not allow carrying out the precise assessment of the snow supplies in mountains. For the last decades not only the number of hydro-meteorological stations and posts was decreased but also the number of observations.

The deteriorated state of snow measuring works significantly decreases the quality of hydrological information. The large territories (river basins, high zones) are not completely covered by hydrological, meteorological and snow measuring observations. It decreases the quality of service of consumers of hydro-meteorological information such as water economy, agriculture, environment protection organizations and emergency service.

Avalanche and mudflow observations do not totally cover the dangerous zones and territories.

The specialised observations and works at such important regional objects as Fedchenko glacier, Abramov glacier and Sarezkoe Lake have been stopped.

At present there is no complete particularised observations in the water

area of the Aral Sea and its perimeter

The network of observations for environment pollutions is drastically decreased. It is necessary to revise the technical equipment of observation network for the ground water quality. The observations of radiation situation in region are carried out on the technically outdated equipment. Due to depreciation of the mobile laboratories or their lack at all the strip and specialized observations are not carried out.

The scientific study of the regional character on assessment of climate change, hydrological and hydro-chemical regimes of rivers of the Aral Sea basin and development of the methodical recommendations are decreased.

V. Priority directions of Programme on improvement of environmental and socio-economic situation in Aral Sea Basin- 2 programme.

On Dushanbe's meeting of State Leaders 'The main directions of the Programme of concrete actions on improvement of environmental and socio-economic situation in the Aral Sea basin for a period of 2003-2010' have been approved. The proposals by priorities are given below.

1. Development of coordinated mechanisms on comprehensive management by water resources of the Aral Sea Basin

Priority objective is the development of agreement packet for regulations of problems of the joint use and protection of water resources with taking into account of the socio-economic development of region, provision of measures on increasing stability and reliability of the inter-state water-regulation bodies work.

The concrete actions lead the Central Asian countries towards joint activity based on the common approaches, effective methods and mechanisms. It is supposed that the inter-sectoral relations, common objectives, sphere and interests, search of compromises and consensus will be founded.

2. Rehabilitation of hydro-economic facilities and improvement of use of water and land resources

Priority objective is the rehabilitation of irrigated and drainage systems.

In this priority the projects directed to the technical improvement and reconstruction of irrigated and collector-drainage systems having the regional importance, to the provision of safety of dams and water reservoirs and to carrying out of special works on investigation of safety of the right bank of the Sarezkoe Lake and increasing the capacity of Kairakkumskii water reservoir are presented. Complex of agro- and water-irrigation actions

with a goal to increase the effectiveness of water and land resources will be developed in priority "Improvement of water and land resources use and increase of their productivity". It is supposed to develop the alternative tasks on regulations of water flow of the Syr Darya River having the regional importance in two projects: "Rehabilitation of irrigated buildings with the inter-state importance in the Aral Sea basin" and "Development of actions on modernization and rehabilitation of drainage system availability and exploitation reliability in the ASB countries".

3. Improvement of systems on environment monitoring

Priority objective is the improvement of environment monitoring system for more total and qualitative collection of data on environment and more effective use of the regional potentials to solve water-economy, environmental and socio-economic problems of the Aral Sea basin. For this reason it is necessary:

- Creation of the regional data bank on water resources to forecast the water-flow;
- Development of system of monitoring of transboundary waters in the Aral Sea basin;
- Improvement of system of monitoring of the region snow-glacial resources;
- Development of the regional model on climate change and effect of these changes on the state of water resources of the Aral Sea basin.

4. Programme on combating with natural disasters

Priority objective is an prevention of water and wind erosion, carrying out the coast-protecting measures, rehabilitation of the forests in zones of water-flow formation and Aral Sea region zone and carrying out the anti-flood, regulation and other works dealing with prevention and liquidation of consequences of the natural disasters.

The Central Asian republics are undergone to the impact of various dangerous nature phenomena, number of which is sharply increased for the last years. Due to that countries suffer the significant damage and have the human victims. Development of actions on prevention, liquidation, reducing the damage and human victims will promote the decrease of consequences of the natural disasters.

5. Programme on assistance to solution of regional social problems

Priority objective is improvement of the socio-ecological situation in region for creation of the normal living standards for people located in the

Aral Sea basin. For that it is necessary:

- To assist in implementation of programmes on people health protection in countries of Central Asia;
- To assist in implementation of programmes on increasing the living s• To assist in implementation of projects on provision of population with drinking water;
- Development of a system of environmental education on the base of principle of continuity as base of sustainable region development;
- Interaction of non-governmental organisations of the Central Asian republics (CAR NGO) and effective participation of public in solution of Aral problems.

6. Strengthening of material-technical and legal base of the inter-state organisations

Priority objective is improvement of inter-state organisations (EC IFAS, ICWC, ISDC and two BWA "Syr Darya" and "Amu Darya") by improvement and strengthening of their legal and material-technical base.

State of material-technical and legal base of inter-state organisations do not correspond to the up-to-date level that complicates the management, especially in years extreme by waters.

The important condition for effective work of the inter-state organisations is improvement of the regional information system, introduction of automated system into hydro-economy practice, provision with the modern facilities of automation, strengthening of their legal and financing status, and improvement of legal norms and rules of their activity.

7. Development and implementation of the regional and national programmes on environment protection actions in zones of water-flow formation

Priority objective is conservation of the mountain, foothill eco-systems and glaciers, for that it is supposed to carry out the study of factor change dynamic effected on decreasing the mountain glaciers and degradation of mountain eco-systems, and to develop the actions on reducing their negative influence.

8. Development and implementation of the regional and national programmes on rational water consumption in branches of economics of Central Asian countries

Priority is presented by one of directions (objective) adopted by heads of CA states: "Rehabilitation of the irrigated, drainage systems and

increasing the productivity of irrigated lands of Central Asia".

The OBJECTIVES of Priority VIII are the following:

- Development and implementation of projects on water saving;
- Rehabilitation of flood-land and tugai reserve "Tiger Gully" due to regulation of water-flow of the Amu Darya River on Nurek water reservoir;
- Integrated management by water resources in lower of Amu Darya and Syr Darya rivers;
- Improvement of hydro-economic situation in Nukus city.
- For implementation of these objectives it have been suggested to create the common information area, network of consulting services and development and implementation of pilot projects in each republic. At the development of the final version of projects the following principles have been accepted as the basic ones:
- Taking into account at maximum the opinions and points of view of all republics and authors presented projects;
- Succession of projects and their correspondence to the implemented programmes of GEF, SPECA, EPIC, ADB, TACIS and others;
- Priority of the regional directions than the national ones at the simultaneous presentation of the regional interests as coordinated (integrated) national ones;
- Exclusion of the backup of projects.

Totally 5 projects are presented in Priority VIII.

9. Development and implementation of the international programme of hygienic-ecological improvement of populated area and natural Aral Sea region eco-systems

Priority objective is assistance in implementation of projects directed to improvement of the natural systems of Aral Sea region. The particular attention will be given to the prevention of salt-dust transfer from drying bottom of the Aral Sea.

10. Development of the international programme on rehabilitation of environmental stability and biological productivity

Priority objective is assistance in implementation of projects on rehabilitation of ecological stability and biological productivity of the natural eco-systems and increase of water eco-system stability in the Aral Sea basin.

It is supposed:

- To provide the environmental drawdowns in deltas of Amu Darya and Syr Darya;
- To determine the economical capacity of water eco-systems of the Aral Sea basin;
- To adhere the regime in water protection zones;
- To assess the limit of permissible load on eco-system;
- Interaction with the regional programmes and projects on conservation of bio-diversity.

11. Conception on sustainable development of the Aral Sea Basin

Priority objective is determination of a system of the regional OBJECTIVES for sustainable development and basic directions of their implementation (including mechanisms of coordination, financing and participation) and increasing the standard of population living to pass the Aral Sea basin to the future generation in a sound state.

For this reason it is necessary to develop and adopt the basic programme document on implementation of the general policy for rehabilitation and sustainable development of the Aral Sea basin.

12. Regional programme of actions on combating with desertification

The priority objective is decreasing the negative consequences of desertification by implementation of measures on combating with desertification and development of the alternative methods of economy, support of the Central Asian Programme on combating with desertification.

13. Development of water-swamp lands in mouths of Amu Darya and Syr Darya rivers

The priority objective is conservation of the water-swamp territories in river mouths by creation of shallow reservoirs network and controlled lake systems and creation of the local pilot industrial territories on conservation of the water-swamp lands and their biodiversity.

14. Rationalisation of use of mineralized drainage waters

Priority objective is an assessment of the collector-drainage waters of river basins and development of the concrete actions on management by water quality and quantity for its use.

VI. Conceptual directions of sustainable development of the Aral Sea Basin

The basic principle of the formation of a Conception of sustainable development of ASB is an acceptance of a system of the regional objectives and main directions on their implementation (including mechanism of coordination, financing and participation of a civil sector). On this base with taking into account the economic, social and environmental conditions of the CA countries the Strategy for SD of the Aral Sea Basin will be developed.

Analysis of key problems of the Aral Sea region allows formulating the long-term goal of its development - to increase the prosperity of region population and to provide the healthy life in harmony with nature.

In according with this objective the following directions are priorities for sustainable development of ASB countries:

1. Development of the regional Convention on problems of ecological safety and sustainable development of the ASB countries.
2. Development of the inter-state relations for achievement of sustainable development, at which the use of water and fuel-energy resources should meet to the economic and environmental interests of the present and future region generations.
3. Improvement of socio-economic conditions, including:
   - Protection of the public health;
   - Increasing the living standard of population. Provision of equitable access to water, land and other natural resources, knowledge and credit resources;
   - Development of education and culture.
4. Strategic planning and management by economics with taking into account the eco-system limitations, provisions for sustainable activity of water basin eco-systems are important for human vital functions.
5. Development of the institute of contractual relations, activation of the inter-sectoral social and global partnership and strengthening of basis potential for sustainable development.
6. Provision with the large access of public to making-decision on problems of the development of the Aral Sea basin. Information transparency.
7. Regional collaboration as a protection from the negative effects of globalisation.
8. Improvement of economic and financing mechanisms for sustainable development. 9. Involvement of investments and business of all levels for sustainable development of region.

VII. Instruments for Programme Implementation

Positive experience of the international programmes (Baltika-21,

IWRM Mecong and others) indicates that it is necessary to develop the mechanisms to support of Programme. The following mechanisms should be included:

- Mechanism of coordination.
- Financial mechanism. The actions in frameworks of the present plan can be financed by the state financing or special economic levers as well as by a system of grants and loans from the local, regional and international sources.
- Mechanism of the legal support. The necessary actions should be based on the intergovernmental agreements between countries of region and national legislation. The common approach to the legal, normative-methodical provision for environment protection and monitoring should be developed.
- Process monitoring.
- Study and Education.
- Connection with other programmes.
- Public participation.

Elimination or ignoring any above-mentioned components leads to decreasing efficiency of the Programme implementation.

VIII. Conceptions of Projects under ASBP-2

The preliminary assessment of local communities situated at the contiguous territories near reserves should be the important stage of Programme implementation. In this case the social activity for a period of project implementation should become a zero reading of the common assessment and monitoring for the following identification of needs, priorities and beneficiaries at the local level, and for the approval of project efficiency.

Conceptions of project proposals developed by the regional working groups and register of project proposals of the national level are presented in Appendixes.

Attachment 1

List
Of regional projects and technical proposals for Central Asia

№	*Project name*	Implementation Date	Approximate cost of project (thous.USD)	The main exercutors and participants
	I. Development of agreed mechanisms for comprehensive water resources management in the Aral Sea Basin			
1.1	**Draft agreements and operation Rules on water resources of Syrdarya Basin taking into account the interests of all consumers and multiyear river flow regulation**	2003 - 2005	1 300	Ministries and Departments of CA countries, IFAS Bodies
1.2	**Draft agreements and operation Rules on water resources of Amudarya Basin taking into account the interests of all consumers and multiyear river flow regulation**	2003 - 2005	1 300	Ministries and Departments of CA countries, IFAS Bodies
1.3	**Draft agreements on general aspects of water resources management in the Aral Sea Basin**	2003 - 2004	300	Ministries and Departments of CA countries, IFAS Bodies
1.4	Development of separate items of the strategy on using and protecting of water resources - Economic mechanisms of operation transboundary water resources and feasibility study of establishment of water-energy consortium (WEC), model and databases	2003 - 2005	2 700	Ministries and Departments of CA countries
1.5	Justification of the Rogun HPS construction	2003 - 2004	220	Ministries and Departments of CA countries, IFAS Bodies
1.6	Definition ecological norms of flows and capacity of the Aral Sea Basin water ecological systems	2003 - 2006	2 200	IFAS Bodies, State Committee of Nature of CA countries

	II. Rehabilitation of water facilities and improvement of usage of water and land resources			
2.1	Project of technical activities to assure the Sarez Lake security	2004	160	Ministries and Departments of CA countries
2.2	Rehabilitation of interstate irrigation facilities in the Aral Sea Basin	2003 - 2008	120 700	Ministries and Departments on water management of CA countries, IFAS Bodies
2.3.	Developing activities aimed at modernization and rehabilitation of capacity and operational reliability of the drainage systems in the Aral sea Basin.	2003 - 2005	1 920	Ministries and Departments on water management of CA countries
2.4	Reconstruction of interstate Daryalyk and Oziornoye collectors	2003 - 2010	200 290	Ministries and Departments of Turkmenistan, IFAS Bodies
2.5	Improving usage of water and land resources and increasing their productivity.	2003 - 2005	1 640	Ministries and Departments on water management of CA countries
2.6	Assuring safety of Dams and reservoirs (2 facilities in each State)	2003 - 2005	4 180	Ministries and Departments on water management and energy of CA countries, IFAS Bodies
2.7	Analisys of the possibility to increase the volume of Kairakum Reservoir	2004	60	Ministries and Departments of Tajikistan, IFAS Bodies
	III. Improvement of environment monitoring system			
3.1	Creation of regional water resources management database for the prognostication of outflow	2003 - 2005	20 700	Ministries and Departments on water management and energy, Hydromets of CA countries
3.2	Development of monitoring system of transboundary Aral Sea basin waters	2003 - 2005	1 380	Hydromets of CA countries, IFAS Bodies

3.3	Rehabilitation and development of hydrometeorological observations in the Aral Sea Basin	2003 - 2010	24 422	Hydromets of CA countries, IFAS Bodies
3.4	Improvement of monitoring system of snow glacier resources of the region	2003 - 2005	745	Hydromets of CA countries
3.5	Working out of region model of climate changes and the influence of these changes on the Aral Sea basin water resources condition	2003 - 2005	540	Hydromets of CA countries
3.6	Restoration and development of specialized observations on high mountain stations - on glaciers «Abramov» and «Fedchenko»	2004 - 2009	5 742	Hydromets of CA countries
	IV. Program for combating natural disasters			
4.1.	Project aimed at the preventing from water and wind erosion and at the bank protecting activities	2003 -2010	7 000	Ministries and Departments of CA countries
4.2.	River bank and land protection works to defend settlements from flood.	2003 - 2005	15 000	Ministries and Departments of CA countries
4.3.1	Rehabilitation of forests and pastures in the area of flow formation	2003-2010	10 500	Ministries and Departments of CA countries
4.3.2	Land usage development of shrinked area of Aral Sea	2004 – 2010	12 060	Ministries and Departments of Kazakhstan and Uzbekistan
4.3.3	Reservation and rehabilitation of forests in the Naryn and Chatkal river basins	2003 – 2010	1 478	Forestry Departments of Kyrgyzstan
4.4.	Anti-flood and regulating activities project.	2003 - 2006	10 500	Ministries and Departments on water management of CA countries
4.5.	Preventing, liquidation and reduction of damages after natural disasters consequences	2003	240	Ministries of Extraordinary Situations, Ministries and Departments on water management of CA countries
	V. Regional program on social assistance			
5.1	Development of intersector economic cooperation on joint rational use of water-land and energy resources by the Central Asian countries	2003-2010	600	Ministries and Departments on water management and

				energy of CA countries
5.2	Working out of regional specialization and cooperation system in the agroindustrial complex	2003-2010	1 400	Ministries of agriculture and water management of CA countries
5.3	Strengthening of cooperation between the countries on international trade and economic organizations activity	2003 - 2010	2 800	Ministries and departsments of CA countries, IFAS Bodies
5.4	Development of regional transport infrastructure	2003-2010	1 500	Ministries and departsments of CA countries
5.5	Stabilization of demographic situation in the region	2003-2006	3 000	Ministries and departsments of CA countries
5.6	**Development of education programs on the civil sector strengthening**	2003-2010	220	Ministries and departsments of CA countries
	VI. Strengthening of material –technical and legal basis of Interstate Agencies			
6	Strengthening of material-technical and legal basis of Interstate Agencies, development of regional information system for managing Aral sea Basin water resources	2003-2010	17 000	IFAS Bodies
	VII. Development and implementation of the regional and national programs on nature protecting measures in the zone of outflow formation			
7.1	Improvement of hydro-glaciological monitoring in the Central Asian countries and glaciers preservation (zone of outflow formation)	2003-2010	1 350	Hydromets of CA countries
7.2	Decrease of natural disaster risk in vulnerable mountainous Central Asian regions (components A- E)	2003-2010	3 750	Ministries and departsments of CA countries, IFAS Bodies
	VIII. Development and implementation of regional and national programs on rational water consumption in the economic sectors of the Central Asia States			
8.1.	Developing and implementing of water saving projects	2003 - 2008	32 800	Academies of sciences, scientific-research institutes, Ministries and departsments on water management

8.2.	Regulating of the outflow of Vakhsh river through Nurek reservoir taking into consideration the interests of the forests reserve " Tiger Gully"	2004	115	Ministries and departsments of CA countries, IFAS Bodies
8.3.	Integrated water resources management in the Aral sea Basin	2004 - 2006	1 750	Ministries and departsments on water management of CA countries, IFAS Bodies
8.4.	Construction of the main water diverted collector and closed horizontal drainage system in 21,22,23 districts of Nukus	2003 - 2007	3 550	Agency "Uzkommunhizmat", water management department of Uzbekistan
	IX. Development and implementation of international program on sanitary-ecological rehabilitation of settlements and natural ecosystems of Pryaralye			
9.1	Assistance in realization of national pilot projects on providing the population with clean drinking water	2004-2006	3 000	Academies of sciences, scientific-research institutes of CA countries
9.2	Improvement of the system on preventing measures from diseases in ecological crisis zones	2003-2010	7 000	Ministries of health protection of CA countries
9.3	Region measures on providing the vital medical preparations	2003-2010	10 000	Ministries of health protection of CA countries
9.4	Development of the strategy on preservation of the genetic fund of the Pryaralye population	2003-2006	1 500	Ministries of CA countries
9.5	Development of the system of voluntary certification of products and production	2003-2010	3 000	State standarts of CA countries
9.6	Development of infrastructure of mountainous regions and of ecotourism	2004-2010	2 000	tourism departmet of CA countries
9.7	Assistance to the population in adaptation to market conditions	2003-2007	3 000	Ministries of economy of CA countries
9.8	Preservation and rehabilitation of tugai forests and pastures in Amudarya and Syrdarya delts	2003-2008	1 350	Forestry Departments of Kazakhstan and Uzbekistan
9.9	Development of measures on prevention of salt-dust transferring from the dried up bottom of the sea (component A - C)	2003-2008	3 000	State Committee of Nature, hydromets and Ministries of Kazakhstan and Uzbekistan

9.10	Development and realization of measures on reduction of transboundary pollution of atmospheric air level	2003-2010	1 900	Hydromets and Ministries of CA countries
9.11	Creation of fishing in Muynak region	2003-2008	280	CLR "Amu Darya", water management Departments of Uzbekistan
	X. Development of international program on rehabilitation of ecological stability and biological productivity			
10.1	Waste products management and reducing of their negative influence on the transboundary water flows of Central Asia (component A-D)	2003-2010	1 900	Academies of sciences, Ministries and Departments of CA countries
10.2	Restoration of near-water ecosystems of Amudarya basin	2003-2006	1 000	Academies of sciences, State Committees of Nature of Tajikistan,Turkmenistanh and Uzbekistan
	XI. Working out of steady development concept in the Aral Sea basin			
11.1	Working out of intersectoral economic cooperation on joint rational use of water-energetic and land resources by CA countries	2003-2006	150	Academies of sciences, Ministries of economy of CA countries
	XII. Regional action program on struggle against desertification			
12.1	Struggle against desertification, development of alternative economic methods	2003-2010	1 800	Academies of sciences, Forestry Departments of CA countries
12.2	Prevention and restoration of degradated lands in the Aral Sea basin	2003-2006	3 500	Academies of sciences, Forestry Departments of CA countries
	XIII. Development of wetlands in downstream reaches of Amudarya and Syrdarya rivers			
13.1.	Development of wetlands in downstream reaches of Syrdarya river	2004 - 2009	23 150	Water Resources Committee of Kazakhstan
13.2.	Development of wetlands in the downstream reaches of Amudarya river	2003 - 2007	8 570	Ministries of agriculture and water management and State Committee of Nature of Uzbekistan
	XIV. Rational use of saline collector-drainage waters			

14.1.	Transboundary return waters management (TTBB) in the Aral sea Basin. Regulation and use of collector-drainage waters. Activity on improvement of collector-drainage waters quality for the purpose of their repeated use to cover the deficit of water resources	2003 - 2009	3 000	Ministries and Departments on water management of Kazakhstan, Turkmenistan and Uzbekistan
14.2.	Completion of "Golden Age" Turkmen Lake construction	2000 -2010	2 000 000	Ministry of water management of Turkmenistan

PRIORITY TITLE

Development of agreed mechanisms for comprehensive water resources management in the Aral Sea Basin

PROJECT NAME: 1.1

Draft of Agreements and Rules of Syrdarya River Basin water resources management taking into account the interests of all consumers and multiyear flow regulation

JUSTIFICATION:

Water and ecological problems of the Aral Sea Basin requires complex entire approach, that should bind all the interests of social and economic development of the Central Asian States and all the sectors - water economy, hydro electric energy, nature complex and Aral Sea.

In this connection one should pay attention to concrete questions, resolution of which will decrease interstate contradictions and enable to prepare needed legislative basis and mechanisms for participatory operation of hydro facilities of interstate significance, agreements on water resources management that maintain reciprocally beneficial state cooperation.

The main disadvantages of BVO "Syrdaria" as an executive body of ICWC are:

- the interests of the sector of energy industry, irrigation and environment on the operation regime of cascade reservoirs are not settled to an agreement.
- The full control of the river water quality is not being conducted that is to be done by the BVO;
- existing limitation of the sphere of BVO activities does not provide an effective water management along the river up to the Aral sea;
- zones of water protection along the river are not determined and control mechanisms have not been established;
- absence of financial commitments among the states on the participatory management and utilization of water resources of the Syrdarya river basin.

These factors require the development of new basin water resources management principles, operation and maintenance of water economy infrastructure of interstate significance. New principles are to be implemented in the form of package of interstate agreements that regulate the Rules of participatory utilization and protection of Syrdarya river

water resources.
The Rules should contain mutual benefits regimes of all reservoirs' operation that guarantee sustainable discharge distribution among all consumers taken into consideration the multiyear regulation growing needs in water and requirements of its quality. In a whole, the economic mechanism of water utilization should include the recommendations on the water resources management for conducting fair water distribution in the interests of all countries and nature complex of Syrdarya basin, including north part of the Aral Sea in different years in accordance with the water availability.

OBJECTIVES:
1. To develop on the basis of the international laws on water principles and national legislation draft agreements on the joint management, utilization and protection of Syrdarya river basin water resources.
2. To develop and agree the Rules of Syrdarya river water resources management.
3. Improvement of the Framework Agreement of 1998.
4. Increasing of efficiency of water entities' operation.

COMPOSITION OF WORKS:
To conduct works on legal documents the working group of national and regional experts is to be created, the composition of which is being agreed by the governments of the Syrdarya basin states. The working group with the engagement of invited foreign consultants will be responsible for the preparation of legal structure and texts of interstate agreements.

Work procedures:
- Development of the Terms of Reference for the project implementation.
- Establishment of the working group that includes representatives of basin states and regional organizations (SIC ICWC and BVO "Syrdarya").
- Adjustment of order and working schedule with the engagement of international consultants.
- Preparation of draft of the following agreements:

1. About the main principles of joint management, utilization and protection of the Syrdarya basin water resources.
2. About the norms of Syrdarya River ecological flow with consideration

of the northern part of the Aral seashore and Aral Sea.

3. Improvement of the Framework Agreement of 1998.

- Discussion of the prepared projects on the national level. In each state the government appoints the National Coordinator and also the National Agreement Commission, which will include representatives of national bodies that is interested in the Syrdarya river basin water resources management, utilization and protection. The national Coordinator is responsible for the preparation of a single national Conclusion on projects that are to be approved by the Deputy Prime-Minister who is IFAS Board member.
- The work group assessment on State Conclusions with the aim of reaching consensus and approval of the text by the States.

The Rules of water resources management, developed on the basis of agreements, should include:

- Criteria, determining quality, volumes and timely water supply to consumers and also rational water resources utilization in all states.
- General Principles of the perennial regulation of Syrdarya river discharge and cascade reservoir operation in different years of water accessibility (water deficiency, floods).
- Mechanism of water distribution-maintaining minimization of non-productive losses of discharges, coordinated sustainable its distribution, including correction of limits in the low water periods and in the high water years.
- Ecological requirements to Syrdarya river water resources, including delta.
- Mechanism on setting limits on pollution releases.
- Mechanism of using of economic sanctions for not fulfilling mutual commitments on water supply to consumers and also for breaking ecological requirements.
- Financial commitments of the states in the joint management of water resources.

The demonstration models are to be developed to support the decisions on the rational regulation and distribution of discharge of the Syrdarya basin rivers for different years of water accessibility, including (in the form of algorithms) principles and mechanisms, set in the "Rules".

ANTICIPATED OUTCOMES:

1. Drafts of agreement texts:

- about the main principles of joint management, improvement of the framework Agreement of 1998 and utilization and protection of the Syrdarya river basin water resources.
- about the norms of ecological discharge of Syrdarya river with consideration of the northern part of the Shore and Aral Sea itself.

2. The Rules of the Syrdarya river basin water resources management.
3. The package of demonstration models.

TENTATIVE COSTS
Total: 1300000 USD

DURATION:
2003 - 2005

PRIORITY TITLE
Development of agreed mechanisms for comprehensive water resources management in the Aral Sea Basin

PROJECT NAME: 1.2
Draft agreements and Rules of management of the Amudarya river basin water resources considering the interests of all the consumers and perennial regulation of discharge

JUSTIFICATION:
Resolution of water and ecological problems of the Aral Sea Basin requires complex approach and harmonization of economic interests of the Central Asian States and nature complex and the Aral Sea.
In this connection with this it is important to eliminate the interstate contradictions and enable to prepare needed legislative basis and mechanisms for participatory operation of hydro facilities of interstate significance, develop agreements on water resources management that maintain reciprocally beneficial state cooperation.
The main disadvantages of BVO "Amudarya" as an executive body of ICWC are:

- despite the undertaken efforts on the water resources distribution between the consumers, it is impossible to avoid disproportions in water consumption especially in the middle- and down-stream of Amudarya;
- the full control of the river water quality is not being conducted that is to be done by the BVO;
- zones of water protection along the river are not determined and the mechanisms of their control have not been established;
- absence of financial obligations among the states on the joint management and utilization of the Amudarya river basin water resources.

These factors require realization and development of new principles for management of the basin resources, operation and maintaining of water economy infrastructure of interstate significance. The new principles are to be implemented in the form of the package of interstate agreements that regulate the Rules of the joint management, utilization and protection of the Amudarya basin water resources.
The Rules of the management of the Amudarya basin water resources should contain the regimes of mutual benefiting works of all the basin

reservoirs, include recommendations on the discharge distribution in different years of water accessibility, what is to maintain sustainable and equable discharge distribution between all the consumers, appointed areas and water using zones. In this case the losses in the discharge of the river, reservoirs and irrigation network.

One of the effective instruments of rational and conflict-free water distribution can become a system of setting norms of discharge losses that must be introduced and used in the practice of the management of the river discharge for the middle- and downstream, considering countries and appointed areas, which belong to them. The "allowed losses" are to be determined for each country, and in case of exceeding them in a deficiency period a special mechanism for redistribution of the limits water intake between the states is to be used.

OBJECTIVES:

1. To develop on the basis of international water law principles and national legislation drafts of agreements on the joint management, utilization and protection of the Amudarya river basin water resources.
2. To develop and agree on the basis of drafts of agreements the Rules of Syrdarya river water resources management.

COMPOSITION OF WORKS:

To conduct works on legal documents the working group of national and regional experts is to be created, the composition of which is being agreed by the governments of the Amudarya basin states. The working group with the engagement of invited foreign consultants will prepare the legal structure and texts of interstate agreements.

Work procedures :

- Development of the Technical Task for the project implementation.
- Establishment of the working group that includes representatives of basin states and regional organizations (SRC ICWC and BVO "Amudarya").
- Adjustment of order and working schedule with the engagement of international consultants.
- Preparation of drafts of the following agreements:

4. About the main principles of joint management, utilization and protection of the Amudarya basin water resources.

5. About the norms of ecological discharge with consideration of the southern part of the Aral seashore and Aral Sea.

- Discussion of the prepared projects on the national level. In each state the government appoints the National Coordinator and also the National Agreement Commission, which will include representatives from each national bodies that are interested in Syrdarya river basin water resources management, utilization and protection. The national Coordinator provides assistance in the preparation of a single national Conclusion on projects, which is then to be approved by the Deputy Prime-Minister, who is the IFAS Board member .
- The work group assessment on State Conclusion with the aim of reaching consensus, adjustment by the states of the amended text.

The Rules of water resources management, developed on the basis of agreements, should include:

- Criteria, determining quality, volumes and timely water supply and also rational water resources utilization in all states.
- Mutual agreement on principles of the perennial regulation of Amudarya river discharge and cascade reservoir operation in different years of water accessibility (water deficiency, floods).
- Mechanism of water distribution (planning and operational management), considering discharge losses and maintaining sustainable and its equable distribution (between the bed, water using zones, countries), including correction of limits in the low water periods and catastrophic water releases in the high water years.
- Proposals on the "recording" of discharge losses.
- Ecological requirements to water resources of Amudarya river, including delta.
- Mechanisms on setting limits on pollution releases.
- Mechanism of using of economic sanctions for not fulfilling coordinated commitments on water supply to consumers and also for implementation of ecological requirements.
- Financial obligations of the states in the joint management of water resources.

The demonstration models are to be developed to support the decisions on the regulation and distribution of discharge of the Syrdarya basin rivers for different years of water accessibility, including (in the form of algorithms) principles and mechanisms, set in the "Rules".

ANTICIPATED OUTCOMES:

1. Drafts of agreement:

- about the main principles of joint management, improvement of the framework Agreement of 1998 implementation and utilization and protection of the Amudarya river basin water resources.
- about the norms of ecological discharge of Amudarya river with consideration of the southern part pre-Aral and the Aral Sea .

2. The Rules of the Amudarya river basin water resources management.
3. The package of demonstration models.

TENTATIVE COSTS:

Total: 1300000 USD

DURATION:

2003 - 2005

PRIORITY TITLE
Development of agreed mechanisms for comprehensive water resources management in the Aral Sea Basin

PROJECT NAME: 1.3
Working out the agreements on general aspects of the Aral Sea Basin water resources management.

JUSTIFICATION:
Water and ecological problems of the Aral Sea Basin need complex and integral approach and harmonization of socio-economic development of CA states and natural complex and Aral Sea .
It is important to eliminate the inter state contradictions , preparation of normative and legal framework an mechanisms for the joint exploitation of hydroelectric stations of interstate significance, agreements on water resources management, favoring mutually beneficial cooperation of the states.
Interstate agreements on the issues of water resources management must be worked out in accordance with International Water Right regarding the local traditions and experience. Existing interstate documents and agreements in the region do not include the issues of joint management of transboundary rivers in Central Asia. Within the framework of this project the package of regulated agreements on exchange of information, ecological regulation, problems of organization as well as interstate arbitration in water sphere should be prepared as general for the region.
Legal support should also be included into normal technical documentation, designing the general aspects of water use and permissible impact of people on the environment. General confirmed rules for preparation, adoption and implementation of decisions as well as the settlement of possible disputes must be worked out.

OBJECTIVES:
Working out the package of documents regulating the special combined management aspects, using and protection of water resources on the basis of International Water Law and national legislation of the Aral Sea Basin countries. These specific rules must add to Basin agreements and guarantee their realization.

COMPOSITION OF WORKS:

For the work over the legal documents the regional working group including national and regional experts confirmed with the Government of the States is created. The working group with invited foreign consultants will work out the legal structure and drafts of interstate agreements. The achievement of mutual understanding between the states on creation of legal base of joint management, use the Aral Sea Basin water resources protection is a long term process.

Work procedures:

- Terms of references.
- The regional working group including the representatives of basin states and regional organizations (IFAS, SIC ICWC, BWO "Amu Darya" and BWO "Sir Darya") are created.
- The draft of agreements is prepared and subject to discussion at national level. Each Government appoints the National Coordinator and establishes the National Commission, including the representatives from each national organ concerned. The National Coordinator will promote in preparation of a single national view that further must be approved by Deputy Prime Ministers being the member of IFAS Board.
- Resolution of each state is assessed by the regional work group to achieve the consensus and then the refined text is submitted to the Governments for approval.
- The national legislation estimate in the sphere of water resources management, international conventions and agreements on transboundary water use regional intergovernmental agreement and other normative legal acts in water branch are carrying out.

ANTICIPATED OUTCOMES:

Recommendations of the Government of CA in closing of national legislations in the sphere of joint water resources management and in preparation of intergovernmental agreement projects on regional cooperation.

Projects of agreements:

1. Agreement on improving the organizational structure of ICWC organizations.
2. Agreement on formation of regional, national and basin information systems and information exchange.
3. Agreement on water quality management to create ecological

sustainability of transboundary water facilities.

4. Agreement on arbitration in the issues of joint management, use and the Aral Sea Basin water resources protection.

TENTATIVE COSTS:
Total: 300000 USD

DURATION:
2003 - 2004

PRIORITY TITLE

Development of agreed mechanisms for comprehensive water resources management in the Aral Sea Basin

PROJECT NAME: 1.4

Development of separate theses to water resources use and protection strategies.

- economic mechanisms of transboundary water resources management and Technical-Economic Basis of Water-Energy Consortium (WEC).
- models and database.

JUSTIFICATION:

Existing plans and the Aral Sea Basin water strategy drafts do not contain the number of important theses on the basin water resources use and protection. In particular, the improvement of steady transboundary water resources management mechanisms and also preparation and agreement of WEC materials need some further study. As a result of development and introduction of mechanism of shared state participation in financing the expenditures connected with run off regulation: the effectiveness of basin water resources use and exploitation of objects of interstate significance will increase.

For the regional collection of national water policies and strategies base on modern technologies it is necessary to prolong the improvement and adaptation of regional water resources management system of existing basin models and database. The accomplished potential modeling projects must be used (ASBOM, ASB-MM and others).

The specialized training serves as a starting point for successful model use.

OBJECTIVES:

1. Working out of economic expenses compensation mechanisms on runoff regulation with the help of complex water reservoirs of interstate significance.
2. Working out of TEB of WEC.
3. Adaptation of basin models and database to existing water resources management system and to tasks of prospective development.

COMPOSITION OF WORKS:

1. Exposition and agreement of interests by the Republic and Organizations

concerned in respect of the objects of interstate significance, existing scheme analysis of the Aral Sea water and energy resources management.
2. Working out of economic management mechanisms of complex water hydroelectric stations having interstate significance (runoff regulation cost determination, operating costs distribution between water and energy sectors and the determination of shared state participation on the defrayment).
3. Working out of TEB of WEC (legal, economic, technical, ecological sections) including the package of constitutive documents (status, types of activity, rights and duties, financing, interaction with existing structures).
4. Renewal of database, improvement and adaptation (calibration) of models, adjustment of information change of modeling results on water resources management between the states.
5. Improvement of water complex development scenarios on the basis of modeling to define the strategies and policies of basin countries; collection of scenarios and recommendation preparation for Water Boards and ICWC.
6. Seminars and training holding.

ANTICIPATED OUTCOMES:
1. Economic management mechanisms of complex water hydroelectric stations of interstate significance,
2. TEB of water-energy consortium.
3. Model system, database and instructions on their usage to realize the complex of regional and national strategy tasks.
4. Recommendations on Water Complex development scenarios of the countries of the region and on their collection at the regional level.

TENTATIVE COSTS:
Total: 2700000 USD

DURATION:
2003 - 2005

PRIORITY TITLE
Development of agreed mechanisms for comprehensive water resources management in the Aral Sea Basin

PROJECT NAME: 1.5
Feasibility study of Rogun HPS construction

JUSTIFICATION:
Within the framework of SPEKA , Rogun HPS was declared to be one of the priority project important for the region . MB Mission examined it during its Work in 2002 and come to the conclusion, on the necessity of considering and agreement of Rogun HPS project as transboundary object by all the republics.

OBJECTIVES:
Working out the package of documents regulating the special combined management aspects, using and protection of water resources on the basis of International Water Law and national legislation of the Aral Sea Basin countries. These specific rules must add to Basin agreements and guarantee their realization.

COMPOSITION OF WORKS:
1. Project work analysis of Rogun ,HPS study .
2. Mutual consultations between the republics .
3. Determination of concrete interests of all the republics of the basin in conclusion of Rogun HPS construction.
4. Preparation of feasibility study and agreement of republics proposals on Rogun HPS construction.
5. Preparation and initiating joint communique Agreement

ANTICIPATED OUTCOMES:
Determination and agreement of mutual interests of SA republics in joints ROGUN HPS construction and exploitation Development of proposals on share match.

TENTATIVE COSTS:
Total: 220 000 USD

DURATION:
2003 - 2004

PRIORITY TITLE
Development of agreed mechanisms for comprehensive water resources management in the Aral Sea Basin

PROJECT NAME: 1.6
Determination of norms of ecological connivance and water ecosystems of the Aral sea basin

JUSTIFICATION:
To keep the normal ecosystems functioning the Aral Sea Basin it is necessary to Determine there needs in optimum water resources volume To determine the possibilities of service and goods rendering by ecosystems we need the evaluation, of it's economic capacity

OBJECTIVES:
Economic capacity valuation of water ecosystems of the basin
Providing the ecosystems with optimum water volume

COMPOSITION OF WORKS:
Determination of ecosystems needs in optimum volume and regime of water connivance,

- Calculation of critical water supplying thresholds of delta ecosystems.
- Determination of anthropological permissible pressure limits and working out if recommendations on providing of study functioning water basin ecosystems.

Important for vital functions.

- Division of water ecosystems into districts according to vulnerability degree.

ANTICIPATED OUTCOMES:
Restoration of delta ecosystems functioning
Restoration of biodiversity
Restoration of pasture lands

TENTATIVE COSTS:
Total: 2 200 000 USD

DURATION
2003 - 2006

PRIORITY TITLE
Rehabilitation of water facilities and improvement of usage of water and land resources

PROJECT NAME: 2.1
Project of technical activities to assure security of Sarez lake

JUSTIFICATION:
A unique Sarez lake with the volume 17,5 км3 with the dam, height 500 м, formed in 1911 as a result of the distortion of a pert of the mountain. The water balance of the lake is maintained because of water filtration directly through the body of the dam. However the equilibrium is nor enough sustainable, during the whole period of the existence of the Sarez lake the level of water was getting high as the result of compression and hydraulic filling of the natural dam's body.
Certain danger of the dam destruction exists also because of the danger of left-bank landslide and forming of breakthrough-wave.
All this indicates the necessity of continuing of study of dam characteristics and conducting technical activities to maintain its sustainability.

OBJECTIVES:
Development of the project of monitoring the state of the Sarez lake.
Development of the project of technical activities on increasing of the Sarez lake's safety.

COMPOSITION OF WORKS:
1. Analysis of available materials. Forecasts of water balances.
2. Study of the structure of the right touch of the dam in the depth of 150 м. Conducting of topographic observations.
3. Development of the project of technical activities on increasing of the dam's sustainability.
4. Development of the project of monitoring the state of the Sarez lake.

ANTICIPATED OUTCOMES:
Risk evaluation of the dam collapse and break-through of the Sarez lake
Development of technical activities.

TENTATIVE COSTS
Total: 160 000 USD

DURATION:
2004-2005

PRIORITY TITLE
Rehabilitation of water facilities and improvement of usage of water and land resources

PROJECT NAME: 2.2
Rehabilitation of interstate irrigation facilities in the Aral Sea Basin.

JUSTIFICATION:
There are in the Amudarya river basin 88 hydro facilities and 36 from them water diverted headworks, 341 км of channels of interstate significance, 167 gauge stations and others.
In the Syrdarya river basin there are 198 hydro facilities, 189 gauge stations, 225 km of channels of interstate significance with operational roads and others.
Amortization level in both of the basins is 65 %.
Because of worsening of technical state of water economy infrastructure (hydro facilities, mechanic equipment, electrical equipment, communication facilities, interstate channels….) indicates that almost all the water economy infrastructure is to be rehabilitated to some extent.

OBJECTIVES:
Rehabilitation of the irrigation facilities of interstate significance in the basins of Amudarya and Syrdarya.

COMPOSITION OF WORKS:
- Preparation of design and cost documentation on the rehabilitation of the water economy infrastructure facilities of both basins
- Implementation of certain works on the rehabilitation of the water economy facilities in both basins

ANTICIPATED OUTCOMES:
- Design and cost documentation on the rehabilitation of the water economy facilities of interstate significance
- Rehabilitation (repair and rehabilitation works, reconstruction) of hydrotechnical facilities, gauge stations, interstate channels, renewal of communication facilities.

TENTATIVE COSTS:
Total: 120 700 000 USD

DURATION:
2003 - 2008

PRIORITY TITLE
Rehabilitation of water facilities and improvement of usage of water and land resources

PROJECT NAME: 2.3
Development of activities aimed at modernization and rehabilitation of capacity and operational reliability of drainage systems of Aral Sea Basin.

JUSTIFICATION:
5.5-5.7 mln. ha of the total 8.0 mln. irrigated area of Central Asia require building of artificial drainage. At the present moment 5.0 mln. ha are to some quality level maintained with drainage that have more than 175.0 thousand km of horizontal drainage including 145.4 thousand km of domestic facilities. About около 2.0 mln. Ha are covered by the drainage of very good quality, 795 thousand ha from which are from the systems of vertical drainage, where till 1990 г. 8.5 thousand of high debit wells had been operated.
In the years of normal operation the drainage systems provided for the irrigated lands relatively favorable JUSTIFICATION, regulating water and salt regimes of soil and balances of irrigated lands, excluding down-stream parts of rivers, where the natural conditions are represented by more heavy soil samples. In this case the lands maintained with the good typed drainage systems with closed horizontal and, especially, vertical one could reach the best soil state improving effect using the least water quantity for washing out and planting the unit of the crop. However, launched in 1970s works on the intensive maintaining with drainage systems of high level have been stopped in the last decades because of the absence of means and the high prices of materials.
The operation of the vertical drainage systems built in Kazakhstan and Tajikistan is almost stopped, and in Uzbekistan chinks are operated with the less periods against the project data, the reason of which is the high prices of electricity supply and pump-power equipment. In the last decade the intensity of the repair and rehabilitation works on each part of the drainage systems was decreased and, especially, in the inner systems. Cost minimization for operation of 1 ha drainage that costs 0.43-0.74 USD in the republics of Kazakhstan, Kyrgyzstan and Tajikistan and 1.85-7.18 USD - in Turkmenistan and Uzbekistan, against required, at least, 75-100 USD has led to decreasing of the operation capacity of the drainage systems

what has been revealed in the state of the irrigated lands, ground waters, the increase of the areas of high salt level, increase of their mineralization, and, as a result, crop capacity of the lands. The indicated data of operation costs relate mainly to operation of reciprocal collectors. In the last decade one can observe the deterioration of the soil state and irrigating water.
At the time problems of soil state improvement and rationalization of water resources utilization and protection require urgent steps to strengthen drainage, rehabilitation of the working capacity of existing drainage system with the implementation of operational steps. In the regions of insufficient drainage it is necessary to conduct new (additional) construction works.

OBJECTIVES:
Evaluation of the present state of all the drainage system parts, determination of main reasons of operational capacity decreasing and on the basis of all that complex development of the complex of organizational and technical steps on their modernization and safety that maintain optimal water-salt and ecological processes on the irrigated lands.

COMPOSITION OF WORKS:
- Observation, information collection and on their basis, evaluation of the technical state of the drainage systems with the determination of the main reasons for decreasing of their operational capacity.
- Analysis of the soil state of the lands maintained with drainage systems, planning zones in accordance with the ground water level, ground water mineralization, soil salt containing in the last decade and determining of the direction of water-salt and ecological processes.
- Analysis of water-salt balances of planning zones (irrigated territory, aeration zones and ground waters) at the present level and determination of the factual drainage module.
- Comparison of the required drainage module with the factual drainage discharge.
- Forecast of water and salt balances of planning zones for the perspective considering the implementation water saving technique and watering technology and steps for increasing efficiency of the systems for the period 2010 - 2225 and on their basis determination of the complex of repair and rehabilitation steps on existing systems and volumes of additional construction works.
- Evaluation of the equipment level of the drainage systems with the water

measuring gauges and development of suggestions on the improvement of the big collectors and inner economy network.

- Development of the complex of steps on the improvement of the operation organization of the drainage systems considering the re-structurization of the agricultural production and establishment of water and land users associations.
- Development of the activities on the organization technologies of conducting repair and rehabilitation works on the existing drainage systems aimed at decreasing of operational costs and, especially, for the facilities of closed and vertical drainage.

ANTICIPATED OUTCOMES:

Feasibility study that includes development of the complex of organizational and technical activities on the increasing of the technical condition of the drainage systems, the level of their equipment of water measuring gauges and also operational safety in conditions of transition to the market economy, determination of the list of the urgent works on the objects of interstate significance.

TENTATIVE COSTS:

Total: 1 920 000 USD

DURATION

2003 - 2005

PRIORITY TITLE
Rehabilitation of water facilities and improvement of usage of water and land resources

PROJECT NAME: 2.4
Reconstruction of the interstate Oziornoye and Daryalyk collectors.

JUSTIFICATION:
Collector systems are built since 1952. Because of the growth of the drainage discharge, originating from the lands of Khorezm, the works on increasing of output capacity have been continued till the present time. The total length of the interstate collectors makes 668 km. The annual drainage discharge is 5500 mln. m3, including 1900 mln .m3. from the territory of Turkmenistan. The systems serve about 1 mln. ha in two neighboring states. Because of the high level of ground waters the quality of the irrigated lands has been deteriorated and, as a result, the crop capacity of the agriculture plants has decreased (crop losses are not less than 25%). It is now necessary to improve the feasibility study with the development, evaluation and implementation of the complex of activities that are directed to decreasing of negative influence of increasing of the ground water levels.

OBJECTIVES:
Improvement of the soil state of the irrigated lands of the Dashguz velayat of Turkmenistan, irrigated lands of the Republic of Uzbekistan and increasing of efficiency of the agricultural production on the area of 1 mln.ha.

COMPOSITION OF WORKS:
- Improvement of feasibility study
- Implementation of the complex of activities on reconstruction of Oziornoye and Daryalyk collectors.

ANTICIPATED OUTCOMES:
Improvement of the ecological situation, increasing of the productivity of the irrigated lands, cost sinking on the production of the agricultural products on the territories of the Republic of Turkmenistan and the Republic of Uzbekistan with the square area of more than 1 mln.ha.

TENTATIVE COSTS:

Improvement of feasibility study	290 000 USD
Collectors' reconstruction.	200 000 000 USD
Total:	200 290 000 USD

DURATION:

2003 - 2010

PRIORITY TITLE
Rehabilitation of water facilities and improvement of usage of water and land resources

PROJECT NAME: 2.5
Improving usage of water and land resources and increasing of their productivity

JUSTIFICATION:
At the beginning of the 21st century the irrigated area of Central Asia is about 8 mln. ha, from which more than 5.0 mln. ha contain too much salt in them and other suffer from erosion processes. At the same time the land areas that can be used to develop the irrigated agricultural production make about 32 mln. ha. Till 1990 in the period of observing intensive agricultural approaches (selection of production composition, seeds selection, tillage and manure, irrigation regime, etc.) and water and soil improving activities, which include struggle against high containing of salt, erosion, floods, and soil erosion with using of drainage on the irrigated areas, it was possible to get rather large crop results in agricultural production. The productivity of the irrigated 1 ha area varied between 1200-1300 till 2500 USD.
In modern conditions agricultural production was done on the irrigated areas, in which the ground waters were rather high and of high rate of mineralization; these lands suffered because of erosion processes and degradation of soil, the approaches of agricultural production are not observed because of insufficiency of assets, technical facilities, technology and normal organization of agricultural works; the technical state of irrigation and drainage systems is being deteriorated, as a result of which the worsening of all the irrigated areas is taking place. In this case the absence of interestedness and collective economic units in the period of transition to the market economy makes even worse the process of rational utilization of land and, especially, water resources. Therefore the productivity of the 1 irrigated ha in Central Asia is now only 500-750 USD/1 ha.

OBJECTIVES:
Research, information collection and evaluation of the modern level of water and land productivity, determination of the main reasons of

decreasing (in quantitative measurement) an on their basis to develop the complex of agro- and land state improving activities that are to increase the productivity of the irrigated areas and irrigating water using in this as least resources as possible.

COMPOSITION OF WORKS:

- research, data collection and on their basis the evaluation of the modern state of soils and productivity of the lands according to site quality with establishing (in qualitative measurement) indicators of their changing;
- development of the complex of agro-technical activities on the rehabilitation and increasing of the productivity of the irrigated lands with consideration of natural and economic conditions of planning zones:
- determination of the most effective composition and seeds of agricultural cultivations;
- establishment of more effective technologies of soil and plant cultivation;
- determination of the watering regime and biological norms of water consumption with consideration of washing out regime of irrigation;
- JUSTIFICATION of expediency and efficiency of seeds and plants rotation introduction;
- development of the complex of water and soil improving steps on the management of water and salt regimes of soil and balances of the irrigated territories and lands with appointment of:
- norms of water consumption in fields with consideration of the technical state of the irrigation system, watering technique and requirement of the washing out irrigation regime;
- norms and optimal terms of washing out for the lands containing high level of salt;
- determination of the activities on the optimal sizes of irrigation fields and irrigation technique elements in the connection of the farming development;
- Forecast of water-salt and ecological processes on the areas of planning and on their basis accurate determination of the drainage capacity;
- Development of the organizational and technical activities on the creation of new forms of land using and water and land resources utilization.

ANTICIPATED OUTCOMES:

Development of the complex of agro- and water-land improving approaches and activities on the increasing of the productivity of the irrigated lands and water in Central Asia.

PLELIMINARY COSTS:
Total: 1 640 000 USD

DURATION:
2003 - 2005

PRIORITY TITLE
Rehabilitation of water facilities and improvement of usage of water and land resources

PROJECT NAME: 2.6
Assuring safety of dams and reservoirs (two objects in each state)

JUSTIFICATION:
Because of the long terms of the operation of dams and reservoir - some changes took place in their state and characteristics, sustainability and safety level of the constructions went down.
Along with this, the absence of the appropriate joint approach and mechanism for safety maintenance, keeping, for interaction of the joint operation of transboundary water economy facilities, which influence the terms continuation of their operation in the safety condition, the efficiency of the assets directed for their rehabilitation, the quality of the water resources management, creates for the Central Asian countries serious problems

OBJECTIVES:
To reach the goal it is necessary to solve the following main tasks:
- Determine and evaluate technical state and operation safety of dams and reservoirs in all the countries of Central Asia.
- Confirm the list and the program of their implementation and mechanisms of further keeping and operation, etc.
- Their equipment with the control gauges and means of accounting of the technical state.
- Creation of the unified database and modern system of monitoring of technical state and safety criteria of dams and reservoirs.
- Establishment in each state of Central Asia of the Foundation for prevention of extraordinary situation and development of the mechanism of their utilization (for the beginning as the first phase in the little volumes).
- Adopt the common rules and unified method of determination of safety for the dam and reservoir operation on the basis of materials collected and selected during the implementation of Component C "Dam Safety" in the international project "Water resources and environment management in the Aral Sea basin " and it is necessary to initiate continuing of these works within the frameworks of the present project "Dam Safety".

COMPOSITION OF WORKS:

- Development of the technical task for the implementation of the program.
- Development of the Agreement draft.
- Conduct the evaluation of the technical state and safety operation of dams and reservoirs with consideration of nature observations.
- Development of the common rules and unified method of the safety determination and also safety criteria of each construction.
- Designing of the project and equipment of constructions with the modern facilities for control and means for accounting of the technical state of dams and reservoirs.
- Acquisition of technical and program means, assembling and adjusting, and commissioning.
- Development of the modern electronic program for the database and monitoring system of the technical state and safety operation of dams and reservoirs.

ANTICIPATED OUTCOMES:

- Interstate agreements on the unified and agreed approach in maintaining sustainability and safety of operation, joint keeping and running of dams and reservoirs.
- Development of activities for maintaining sustainability of 10 dams (2 in each country).
- Maintaining of the awareness for the analytical information processing and taking the appropriate steps to use the assets with more efficiency, beforehand planning of repair and rehabilitation works, and also equipment renewal and facilities' reconstruction that have to do with maintaining sustainability and safety.
- Prevention of extraordinary situations of dams and reservoirs.
- More efficient management of water resources at the expense of loss minimization, which relate to the present technical state of dams and reservoirs.

TENTATIVE COSTS

Total: 4 180 000 USD

DURATION:

2003 - 2005

PRIORITY TITLE
Rehabilitation of water facilities and improvement of usage of water and land resources

PROJECT NAME: 2.7
Development of feasibility study for increasing capacity of Kairakum reservoir.

JUSTIFICATION:
At the present moment the biggest reservoir in the Syrdarya river basin Toktogul reservoir in Kyrgyzstan has to function in winter in the energy regime. In these conditions the augmentation of the Kairakum reservoir's volume can increase water accessibility of the irrigated land of Uzbekistan and Kazakhstan.

OBJECTIVES:
Determination of the technical opportunity and economic expediency of increasing of the dam of Kairakum hydro facility and enlarging its regulating volume to increase the efficiency of the water and energy resources management of Syrdarya river.

COMPOSITION OF WORKS:
Design developments on the dam, protecting dams, flooding zone of HPS. Feasibility calculations of the variants. Calculations of the regulation regimes. Preparation and issuing of the booklet.

ANTICIPATED OUTCOMES:
Determination of the most optimal variant of the volume augmentation of Kairakum reservoir. Economic benefits in the irrigation industry for Uzbekistan and Tajikistan.

TENTATIVE COSTS:
Total: 60 000 USD

DURATION:
2004

PRIORITY TITLE
Perfection of environmental monitoring

PROJECT NAME 3.1
Establishment of regional data base on water resources, with the purpose of flow control

JUSTIFICATION:
Correction of the existing shortcomings in water resources management at regional level and functional efficiency improvement can be achieved through further development of the proper decision making tools, which includes creation of regional data base and information system on water resources. The major task of this Program is creation on the basis of modern technical and telecommunication means, unified informational system in order to perform control over flow formation and precipitation, evaluation of different aspects of its use, prognosis and means for achieving potential level of effectiveness, ability to realise sustainable management on water resources of all type use control.
Success of hydrological prognosis at large extend depends on the quality and availability of necessary information.
Absence of this information at large extent implicates precipitation of flow as for the picture remains unclear concerning vast water collecting territories, which make basic contribution into surface water collectors.
With progressive development of methods of meteorological prognosis, increased requirements to the precipitation, expansions of the service zones and its automatization the essential role is obtained the growing scale of processed information. Creation of Regional database on water resources must be directed to provision of information of complex system of continual precipitation of the flow (short, medium, long and overlongterm).
It is important to elaborate and to introduce "Treaty on creation of regional and national database on water resources and information system of flow control over formation and formation, use and protection of water resources of the pools of Amu Darya and Syr Darya rivers ".

OBJECTIVES:
- Creation of regional and national database and information system of control over flow formation precipitation, use and protection of water resources of Amy Darya and Syr Darya rivers;

- Reception of major data for economic analysis of the region wide issues;
Preparation of analytical information as a basis for regional issues resolution;
Installation of regular communication and information exchange between organisation- the participants of the region;
Preparation of monthly, annual, and many year /permanent data base on water resources management;
Institutionalisation of data collection and exchange between national data base knots.

COMPOSITION OF WORKS:
Preparation and comprising of Technical Task on completion of the Program;
Development of the draft of the Agreement
Selection of the complex of technical means development of the tasks for the aggregates and control;
Procurement of technical means and software, installation, exploitation;
Staff training

ANTICIPATED OUTCOMES:
Regional database on water recourses with purpose of giving prognosis on the flow containing all the necessary information for water recourses management in operational regime and for future.

TENTATIVE COSTS:
20 700 000 USD

DURATION
2003 - 2005

PRIORITY TITLE
Perfection of the system of environmental monitoring

PROJECT NAME 3.2
Development of the system of monitoring of tarns border water of the Aral sea basin

JUSTIFICATION:
In Central Asia almost all more or less large rivers are trans border ones. Formation in the Aral sea basin of 5 sovereign states radically has changed the point of view on trans border water resources transboundary as for the deviations of water quality alter the cost of its volume in upper watershed and downstream.
Which as a rule belong to different states. Under these conditions the problem of optimal distribution of water resources is very acute, tightly connected to its quality status. Solution of this problem without developed system of monitoring of trans border practically impossible.
At the same time the system of monitoring is to be based on a unified observation network with distinctly established list of representative indicators, allowing to get objective evaluation of hydrological regime and water quality of the object under control.
With that it is important to institute list of regional common indicators and local indicators, shaped under the specific aspects of local sources of pollution of trans border water flow. Introduction of unified network and observation indicators based on control of individual peculiarities of the water flow and environment and before all sources of pollution coupled with consideration of its self cleansing ability is informational base for evaluation and precipitation of trans. border rivers' flow.
The flow of the most of the rivers is formed in Tajikistan and Kyrgyzstan. Their many purpose use is performed in these states as well as basically in Uzbekistan, Turkmenistan, and Kazakhstan. Just distribution of its water resources is impossible without proper water flow control, quality evaluation, continual control over the use. Traditionally, each NHMS of Central Asia performs data control and analysis on flow of the rivers in their territory, passing neighboring NHMS important data.
Presently this system falls due to absence of manufacturing of hydrometric equipment accouterment, and materials, outflax of specialists due to low wages.Certain difficulties emerge due to political reasons. International

assistance in overcoming the crisis, monitoring of trans border water, reflected in realization of the project GEF on reequipment of 25 check points on the trans border rivers is very much careful but is not sufficient.

OBJECTIVES:

To develop system of monitoring of trans border rivers is necessary:
To define unifies network of observation checkpoints and to reason representative list of regionally and locally controlled indicators of tarns border water monitoring.

- Define parameters (terms, observation frequency) and to establish unifies methodological and material and technical provision of monitoring of trans border water resources
- To create a bank of hydrological data of trans border water as a part of general bank of hydrological data.
- To arrange publishing of hydrological annual issue" Trans border water"i9n a form of a united issue of all countries of the region.
- To arrange publishing of quarterly bulletin "Trans border water"
- The model of publication should be developed by SANIGMI, KAZNIIMOSK jointly with NHMS.
- To arrange the system of inspections of hydrological check points on the trans border rivers, canals, and collectors along with conduction of control measurements.

To create methodological center on activities management on the trans border rivers being represented among SANIGMI, KAZNIIMOSK

COMPOSITION OF WORKS:

- Comprising of Technical Task on realization of Program;
- Analysis and evaluation of the modern hydrological and hydrochemical regime of trans border water resources;
- Identification of major and specific sources of pollution of the trans border resources;
- Development of unified network of observation and monitoring parameters of the trans border water resources;
- Identification of representative regional and local hydrological, microbiological and hydrobiological monitoring indicators of the trans border water resources;
- Establishment of unified methodological and material and technical provision of monitoring of trans border water resources.
- Tutoring of staff.

ANTICIPATED OUTCOMES:

- Regional system of water resource monitoring (quantity and quality).

Defined unified network and parameters of monitoring of trans border water resources;

- Established representative list of regional and local hydrological, hydrochemical, microbiological and hydrobiological indicators of trans border water resources monitoring;
- Defined unified methodological and material and technical basis of tarns border water resources monitoring.

TENTATIVE COSTS:

1 380 000 USD

DURATION

2003 - 2005 гг.

PRIORITY TITLE
Perfection of environmental monitoring system

PROJECT NAME: 3.3
Rehabilitation and development of the network of hydrometeorological observations in the Aral sea basin .

JUSTIFICATION:
Regional hydrometiorological network presently due to its fall is not able to satisfy the requirements of the economical organizations of CA countries. In compare-son to 1980-85 (the period of maximal development of observation system) the number of stations decreased from 21% to 66 % depending on the territory and types of the observations, and some types of observations were completely stopped.
As a result sufficiently large Aral sea basins occurred to be not entirely clarifies in terms of hydrometeorological observations. Density of meteorological network is 0,12-0,90 points per 1000 km^2.
Observational hydrometiorological network of the region is equipped with morally and physically old equipment and accouters, communication means. Absence of meteorological observations in high mountainous zone that does not allow to perform exact evaluation of the snow stored in the ;mountains. For the last decades decreased not only number of agro hydrometiorological stations and points, but as well number of observations.
Exacerbated situation with snow metering activities sufficiently decreased the quality of hydrological information. As a result sufficiently large territories (river basins, high mountainous zones) occurred not completely clarified with hydrological, meteorological, and snow metering observations, that decreases quality of service of the consumers of hydreeteorological information such as agriculture, environment protection organizations and emergency services.
Avalanche and mudslide observations do not cover at full extent dangerous areas and territories.
Were stopped all kinds of specialized observations and works in such important objects as glacier Fedchenko glacier Abramov and Sarez lake. Presently full scale of the work on specialized observations in the aquatorium of the Aral sea and its perimeter are not conducted.Was stopped expeditional works in high mountainous dangerous with breaking through lakes, aquatorium of the Aral sea and Prearal.

Observation network on pollution of environment in the Aral sea basin has been sufficiently reduced. Technical equipment needs complete revision of the observation network on the quality of the surface water. Observation of radiation in the region are conducted with morally and technically old equipment.
Due to worn out and absence of mobile laboratories are not conducted route and specialized observations.

OBJECTIVES:
Rehabilitation and development of quality environment monitoring networkокружающей in the Aral sea basin in order to define modern conditions of climate formation, river flow and parameters of its regime, which is important to perform calculations on justifications of measures, providing improvement of Syr Darya and Amu Darya rivers regime and the Aral sea regime.
Complex evaluation of pollution of environment in the Aral sea basin.

COMPOSITION OF WORKS:
- Comprising of Technical Task on implementation of the Project;
- Requirement environment monitoring in the Aral sea basin with technical program means complying with modern international requirements.
- Staff training .

ANTICIPATED OUTCOMES:
- Regional environmental monitoring system.
- Objective information on current condition of environment for calculations and perceptions consisting the Aral sea basin flow inclusively.
- Information for elaboration of measures on improvement of environment in the Aral sea basin.

TENTATIVE COSTS:
24 422 000 USD

DURATION:
2003 - 2010

PRIORITY TITLE
Perfection of environmental monitoring system

PROJECT NAME: 3.4
Perfection of monitoring system over snow and is resources of the region

JUSTIFICATION:
In the mountainous regions of CA are located the largest areas of the modern оледенения. Glaciers are here in the second place after seasonal snow the source of river provision. They are the natural accumulators of the purest drinkable water, the importance of which for the region is impossible overestimate.
Glaceries lakes are constant potential threat to high mountaneous territories. Very frequently spillage and rapid emptying of such lakes lead to formation of catastrophic mudslides which in their turn greatly damage economy and cause human causalities
In connection to that monitoring of glaciers and glacier's lakes becomes one the bases of management system, water resource precipitation and prevention of dangerous natural phenomena.
The last data on research of the region were received on the situation in 1980. To get these data were used analogy cosmic shots of Soviet satellites. According to data of range of authors in the end of XXth century occurred apparent warming of the climate of the planet in particular those process has consigned the territory of CA. Glaciers . Glaceries as climatic products have suffered sufficient changes as well .
Monitoring of potentially dangerous glacier's lakes through airvisual observations remain insufficient, to cover entire region and evaluate the real situation.
For that reason modern distant methods are particularly the instruments, which will allow to solve such tasks successfully. According to the experience of the developed countries, similar monitoring of the nature and natural phenomena hundredfolds justifies the means invested

OBJECTIVES
The major goal of the program is monitoring of the mountainous glaciers and glaciers' lakes with the use digital satellite information with high capacity разрешающей способности.
Monitoring includes two connected to each other tasks: identification

(detection) of mountainous glaciers and attached to them glaciers' lakes with the use digital satellite shots of high высокого разрешения (ASTER, Landsat, Spot), as well as their evaluation and cataloguezation with the use of technologies of geographic information system (GIS)

COMPOSITION OF WORKS:

The following stages of work are to be performed for solution of the mentioned problem:

- Search, selection and inquiry of digital satellite shots of high or the region of research высокого разрешения from principal cosmic agencies.

Processing of shots , its correction and projecting .

- Identification, classification of glaciers and glacier's lakes its vectorization
- Comprising of the catalogue of glaciers and glacier's lakes for the moment
- Comprising of large digital relief model (DRM) or adaptation already possesses DRM
- Creation of GIS " Mountainous glacier and glacier's lakes", as water resource monitoring system.
- Evaluation of changes in separate basins and in a whole for the region
- Detection of pulsating glaciers.

Training for final users.

ANTICIPATED OUTCOMES :

The result of the work conducted will be an updated catalogue of the mountainous glaciers and glaciers; lakes integrated into the GIS. For hydrologic evaluations and precipitation of snow and ice portion of the river flow For glacierologists'; morphometric characteristics of modern оледенения.

For climatologists' : possibility to model the processes of climatic changes in global and regional scale. Ministry of Emergency provision of information on possible natural contingencies.

TENTATIVE COSTS :

745 000 USD

DURATION

2003 - 2005.

PRIORITY TITLE
Perfection of the environmental monitoring system

PROJECT NAME: 3.5
Development of regional model of climatic change and its effect on the changes of water resource situation in the Aral sea basin

JUSTIFICATION:
River flow in CA is formed basically on the account of snow accumulation in the mountainous area and depends on the temperature the air and atmospheric осадков. Climate alteration in the region i.e. the growth of the temperature of the air and alteration of precipitation, will ultimately lead to alteration of river flow, which will result in the quantity of water, taken for irrigation.
Outcomes the results of global models of general circulation of atmosphere and of the ocean (MGC) is the most complying basis for construction of regional scenarios of climate alteration, which in their turn serve as a basis of regional vulnerability estimates and adaptation strategies to possible climate alterations. However information got from MGC as a rule has moderate space coverage, the best will be around 3°, which complies with 330km in the equator. Such low space coverage is the major limiting factor for broad use of the MGC results while evaluating climatic change affect.
One of the ways of the space coverage in detailed way of the outcomes of MGC is the use of hydrodynamic models with high capacity for limited areas, named Regional Climatic Models RCM They allow to have more detailed description of the climate.
To get more reliable estimates of the climatic alteration affect on water resources it is necessary:

- To use more perfected models of MGC and RCM;
- To perfect methodology on climatic changes evaluation affecting flow on the basis of mathematical model of flow modeling;
- Adaptation of new climatic scenarios to model's calculations of flow alteration;
- To conduct number indicator experiments on evaluation of potential vulnerability of water objects and their regime;
- Evaluation of glacier storage, concentrated in the mountainous areas of CA and their possible changes
- To research reactions of the glaciers flow and snow cover on possible climatic alterations

OBJECTIVES:

- Development of methodology and computer model of regional evaluation of the river flow alteration the Aral sea basin under the influence of flow forming factors, due to possible climatic alteration.
- Reception of most reliable scenarios of regional climate characteristics change in order to conduct evaluation of effect of climatic change on natural resources and economy sections.
- Development of the methods of statistical interpretation MGC.
- Evaluation calculations of the river flow under different climatic scenarios, which presently are being developed by criminologists in new, modernized variants.

To improve reliability of the evaluations of possible changes in regional climatic system.

COMPOSITION OF WORKS:

- Evaluation of available water resources depending on different scenarios of climatic changes, including inflow in Prearal.
- Development of the model and computer realization of basin model of formation and distribution of the flow of the rivers of their Aral sea basin depending on climatic factors (air temperature, atmospheric precipitations e.t.c.).
- Analysis and selection of possible scenarios of the climatic changes in CA, on the basis of outcome results in global climatic model on the basis of outputs of global climatic model.
- Arrangement and performing of with insertion of number indicators with the use of regional model of formation and distribution of river flow according to selected scenarios considering interseasonal distribution of flow in dynamics.

ANTICIPATED OUTCOMES:

- Regional model of climatic change and evaluation of the effect of the climatic change on situation with resources of provision of rivers and water resources in a whole in the Aral sea basin
- Informational program complex (model, data base, interface) for conduction of evaluation of the flow of the Aral sea basin rivers under different climatic changes scenario

TENTATIVE COSTS:

540 000 USD

DURATION

2003 - 2005

PRIORITY TITLE
Improvement of environmental monitoring system

PROJECT NAME: 3.6
Reabilitation and development of specialized observations on the high mountain stations - on the glaciers "Abramov" and "Fedchenko"

JUSTIFICATION:
At present the observations on the stations situated on the glaciers "Abramov" and "Fedchenko" are not carried on. The mentioned stations are unique, as the information received from them is necessary for the forecasting of the river flow in the Aral Sea Basin. The existing Regional network of hydrometeorological stations is insufficient for the more accurate forecastsof the river flow. There is shortage of information, especially on high mountain territories, for hydrometrological annuals and climate guides. Systematic observations over the snow-glacier resources of the region are not carried on.

OBJECTIVES
Reabilitation and development of specialized observations on the high mountain stations - on the glaciers "Abramov" and "Fedchenko", for the definition of modern climate forming conditions, parameters of its regime. All this is necessary for the calculation of the Sydarya and Amudarya rivers flow, assessment of hydrometeorological and climatic conditions. Assessment of environmental pollution in the Aral sea Basin

COMPOSITION OF WORKS:
- Drawing up of the Technical task on the Project implementation;
- Supplying of the stations situated on the glaciers "Abramov" and "Fedchenko" with technical and programm means, satisfying the modern international requests, and with the equipment for the transmitting of hydrometeorological information etc.
- Rehabilitation of systematic observations over the snow-glacier resources.
- Training

ANTICIPATED OUTCOMES :
- Objective information on the current environmental condition for the calculation and forecasts of the Aral sea Basin rivers flow, assessment of hydrometeorological conditions of the high mountain territories of

CA, collection of information for the climate condition assessment.

- Information for taking the measures on rehabilitation of environment in the Aral sea Basin

TENTATIVE COSTS :
5 742 000 USD

DURATION
2004 - 2009.

PRIORITY TITLE
Program for combating natural disasters.

PROJECT NAME: 4.1
Project aimed at preventing water and wind erosion, conducting of bank defending activities

JUSTIFICATION:
Conducting of prevention activities, aimed at prevention or decreasing of losses, resulted from, flood flows, landslides and avalanches is a strategic direction in the combating the erosion phenomena, desertification processes, preservation of the biological diversity in the mountain and pre-mountain zones. The active impact on the flood flows processes enables to regulate hard flow and decrease the losses, related to silting of rivers, irrigation facilities, not wanted processes in the deltas of rivers. At the present moment there are no documents that regulate depletion of the flood flow risky lakes, what led to catastrophic consequences, including death tolls of people and material losses. In case of global climate warming the activity of the rain genesis grows by tens and even hundreds times.
Introduction of the legal documents, regulating prevention activities will allow to decrease expenses by tens and hundreds times that are necessary for safety maintenance of the population and sustainable development of the Aral Sea Basin and also without extraordinary conducting of prevention activities.
The natural conditions of the region, character of water and land resources usage creates potential danger of appearing of all kinds of erosion. The wind activity harms a lot, which initiates not only soil deflation but also harmfully affects the plants resulting in losing of elements on the cotton-plant, harms cereals. 75% of all agricultural areas are subject to the harmful impact of the wind activity. About 20% of not irrigated lands suffers from water erosion. It is widely spread on the mountain lands, where plant coverage is poorly developed or with the land cultivated with the mistakes. On the irrigated lands, resulting from the wrongly conducted irrigation (big norms of water, ill planned irrigation areas, large bias of irrigation channels, etc) is represented an irrigation erosion.
Flood flows are very dangerous for the national economy. They can destroy a lot of stuff and they are characterized to be sudden. In the late 1970s against erosion activities scheme was worked out. They indicated the

necessity in the complex of organizational and economic, agrotechnical, forest improving and hydrotechnical against erosion activities, their volumes and TENTATIVE COSTSs were determined.
At the present moment these schemes need to be corrected, after what they can be used while planning against erosion works.

OBJECTIVES:

- Increasing of efficiency of against flood flows and against erosion activities.
- Assuring the population security
- Decreasing of expenses prevention measures
- Creation of new working places for the population of the mountainous rayons, decrease of unemployment.
- Determination of works volumes, TENTATIVE COSTSs and order of conducting of organizational, agrotechnical and hydrotechnical against erosion activities;
- Resolution of the organizational activities on the conducting of these works

COMPOSTION OF WORKS:

- Working out of the methods of preventing depletion of lakes of glacial origin complex.
- Development of construction rules and norms "Prevention depletion of lakes of glacial origin complex "
- Development of the methods of deciphering and mapping of flood creation zones of rainfall origin.
- Development of construction rules and norms "Melioration of creation zones of rainfall origin".
- Correction of schemes of antierosion activities;
- Working out of antierosion activities for the period till 2010.;
- Conducting of the complex of organizational, agrotechnical, meliorative and hydrotechnical antierosion activities;
- Development of economic mechanisms, stimulating land users to conduct antierosion activities.

ANTICIPATED OUTCOMES:

- Methodology of prevention depletion of lakes of glacial origin complex;
- Construction rules and norms "Prevention depletion of lakes of glacial

origin complex ";

- methods of deciphering and mapping of flood creation zones of rainfall origin.;
- construction rules and norms "Melioration of creation zones of rainfall origin".
- Schemes and plans of antierosion activities;
- As a result of the activities the efficiency of land resources usage will increase, conditions for soil capacity reproduction and protection will be created.
- Forest improvement antierosion processes;
- Hydrotechnical antierosion activities;
- Agrotechnical and organizational antierosion activities.

TENTATIVE COSTS:

Costs of methodology works	120 000 USD
• Forest improvement antierosion activities;	853 000 USD
• Hydrotechnical antierosion activities;	1 995 000 USD
• Agrotechnical and organizational antierosion activities.	3 722 000 USD
Total:	7 000 000 USD

DURATION:
2003 - 2010

PRIORITY TITLE
Program for combating natural disasters.

PROJECT NAME: 4.2.1
River bank and land protection works and development of information and program complex for visual analysis of river bank protection activities

JUSTIFICATION:
Because of the climate changes on the whole planet very big changes in the forming of water resources in the Central Asia are taking place. As a result in the last years it is often that there are low water and water resources deficiency, shallowing of the rivers and deterioration of the water capacity of the rivers. When little high water on the shallowing rivers takes place it is possible to see flooding of the next to the bank lands, what very negatively reflects on the perseverance of the national economy facilities and requires the activities aimed at protection of river banks.

OBJECTIVES:
- Develop three dimensional mathematical model of movement of two phase balanced flow in conditions of the river bed deformation. To implement the program realization of the model and work out a special program complex, which is a part of the computer working place of designer-engineer of hydro facilities. To give recommendations on its usage for the analysis of river bank protection.
- Determination of the river beds' stats, bank defending and bed regulating facilities.
- Evaluate the of the rivers' bed capacity.
- Selection of the type and combination of bank defending activities.

COMPOSITION OF WORKS:
- Develop three dimensional mathematical model of movement of two phase balanced flow in conditions of the river bed deformation.
- Program realization of the mathematical model.
- Calibration of the mathematic model in accordance with the retrospective data on the dynamics of formation of meanders in the bed of Amudarya river.
- Development of the specialized program complex, which is a part of the computer working place of designer-engineer of hydro facilities.

- Development of recommendation on the usage of special program complex for the analysis of bank protection activities.
- Development of technical task for the project implementation.
- Conduction of the natural observations on the especially dangerous parts of rivers of Central Asia.
- Learning of working experience of the existing bank defending and bed regulating constructions.

ANTICIPATED OUTCOMES:

- Information and program complex that maintains three dimensional visualization of hydro dynamic parameters of flow, which is a part of the computer working place of designer-engineer of hydro facilities.
- Recommendations on the usage of special program complex for the analysis of bank protection activities.
- Working out of the advanced method of calculation of the bank defending constructions.
- Selection of the reliable constructions with the usage of local building materials.

Bank defending activities, maintaining reliable defense of the bank stripe of rivers of Central Asia.

TENTATIVE COSTS:

Total: 15 000 000 USD

DURATION:

2004 - 2006.

PRIORITY TITLE
Program for combating natural disasters.

PROJECT NAME: 4.3.1
Rehabilitation of forest and pasture reserves in the water gear formation zones.

JUSTIFICATION:
In the water flow formation zones there are pasture, wind and water erosion that favour avalanches and mud flows. One of the favouring factors are also lack of forestry or the sparse growth of trees, bad grass protected of slopes. Forestry and herbage play the role of soil and water protectors, water flow regulators, climate formers in the states situated in the water distribution zones.

OBJECTIVES:
- To extend the forestry area as well as coastal fortification and forest protecting plantations;
- To increase the herbage by pastures cattle regulation.

COMPOSITION OF WORKS:
- Project documentation preparation and cultivation, transplanting of seed materials and their protection.
- Regulating pasture using.

ANTICIPATED OUTCOMES:
- The risk of mudflows, flooding, wind and water erosion is reducing.
- The seasonal water resources distribution and dependable work of hydro facilities are guaranteed.
- Ecological and economic losses caused by nature-climate phenomenon are being minimized.

TENTATIVE COSTS:
Total: 10 500 000 USD

DURATION:
2003 - 2010.

PRIORITY TITLE
Program for combating natural disasters.

PROJECT NAME: 4.3.2
Opening up of desertificated parts of the Aral Sea.

JUSTIFICATION:
About 300 days a year salt-dust storms blow in the region. According to the data of some researches 75 mln tons sand and dust raise into atmosphere from the dried up bottom. And on 1 ha of irrigation land of pry Aral there are 520 kg of slats causing damage to cultivated crops. The desert Arakum has already occupied 2 mln ha of arable lands and favoured the degradation of pastures, tugai forests and other vegetation. The lowering of the sea level and decreasing of water surface is continuing and this means that much more salined soil becomes clear from the water and in the future the air of pry Aral will be much more salted with poisonous salt and dust harmful for every living thing.
Creation of protecting forest-plantations of drought resisting desert vegetation which can become the main climate-regulators on the dry up bottom should ease ecological tension in pry Aral.

OBJECTIVES:
- Creation of protecting forest-plantations of drought-resisting desert vegetation to avert salt dirt carrying over from desert parts of the Aral Sea.
- Protection of agricultural fields from заносс by movable barkhan sands.

COMPOSITION OF WORKS:
To implement these set tasks the following work must be done:
- working out of project estimate documentation on creation of protecting forest-plantations on the area of 240000 ha;
- carrying out of forest amelioration measures on deserted parts of the Aral Sea.

ANTICIPATED OUTCOMES:
- creation of protecting forest-plantations on the area of 240000 ha on deserted parts of the Aral Sea will become the term for steady development of nature in this region that will also allow to increase the forage reserve for pasturing cattle that favours the improvement of socio-

economic situation of the population.

TENTATIVE COSTS:

• working out of project-estimate documentation	60 000 USD
• creation of protecting forest-plantations on the area of 240000 ha on the deserted part of the Aral Sea	12 000 000 USD
Total:	12 060 000 USD

DURATION:
2004 - 2010.

PRIORITY TITLE
The program on struggle against natural disasters

PROJECT NAME: 4.3.3
Preservation and restoration of forests of the Narin and Chatkal river basin.

JUSTIFICATION:
In starting from the highest point of the river till the flowing into the river SyrDarya along its inflows and banks regarding its vertical zone line the forests consisting of coniferous and deciduous trees grow. Because of the intensive forest using in the period of 1930-1988 forest areas in the Republic of Kyrgyzstan reduced almost half as many or in 513,3 000 ha. Nowadays the forest area continues to reduce. One of the reasons is increasing of wood using as firewood, because of the difficulty in tradition kinds purchasing-coal, gas etc., besides the forests of the region tend to become old. At present the nature and standing too long forests make of the general reserve 49,94 000 or 353,3 000 ha. In the course of time the standing too long trees become the main hotbed of pests and diseases. In view of felling and trangering of the forestry to long-term use. The area covered with trees has abruptly reduced, and in spite of the rehabilitation measures last 55 years the forest area according to data of 01.01.1998 in Narin region amounts to 105,5 000 ha that with respect to 1930 makes 47.64.
Such a collapse of forest area has a bad influence on the high hater level of Narin river in the beginning of its sources already.
Narin river coming up to Jalal-abad region has a big high-attitude overfall and here it flons not on the high attitude 500-600 meters above sea-level from Toktogulsky water reservoirs till its confluence into SyrDarya.
The reserve of water is increasing due to inflows of the rivers starting in nut-tree forests of Jalal-Abadsky region, such as hodja-Ata, kara-Darya, Chicken that flows into Narin.
But the main inflows of Narin start in nut-tree forests the condition of which leaves much to be desired.
According to the data 01.01.1998 the area covered with forest in Jalal-Abad region makes 274974 ha, including tianshan fir-tree - 8049 ha, silver fir - 3365 ha, softdesiduous - 6240 ha, walnut - 33200 ha, pistachio-tree - 32464, apple-tree - 14885 ha, almond-tree - 978 ha, and others- 117446 ha.
In nut-tree forests of Jalal-Abad region there is spreading of deleterious insects.

Forests situated in Narin basin have high subjection to fires, that is increasing every year.

OBJECTIVES:

- To increase the area, covered with forest in the zone of Narin flow formation.
- To improve the forest condition and their plenitude that in its turn increases the output of the rivers.
- To extend the coastal fortification area.
- To liquidate the hotbed of deleterious insects.
- To increase the walnut, pistachio, apple, and others gatherity.

COMPOSITION OF WORKS:

The main Narin enterprise will grow the plants of tianshan fir-tree, willow, poplar in volume of in year 2003 - 2620,000 pieces, in year 2004 - 2680,000, in year 2005 - 27000,000, in year 2006 - 2800,000, in year 2007 - 2800,000, in year 2008 - 2800, 000, in year 2009 - 2800,000, in year 2010 - 2800,000.
The grown trees are planted on the area of 12580 ha, and reaching 10-15 years old will be transferred to the area covered with forest.
Providing of forest protection from pests, illegal felling of timber and fires that means to provide the forest stabilization.
The work on struggle against leafgrowing insects is carrying out.

ANTICIPATED OUTCOMES:

In general in the Narin and Chatkal basins there is the planting of forests for the period of 2003-2010 in the volume of 12580 ha.
The hotbeds are liquidated, the forest protection from illegal felling and fires is ensured.
The forest stabilization will increase, evaporation will reduce and the water flow will extend that will influence the high water level.

PLELIMINARY COSTS:
TENTATIVE COSTS 1 478 000 USD

DURATION:
2003 - 2010

RIORITY TITLE
The program on struggle against natural disasters

PROJECT NAME: 4.4
Development of projects on anti-freshet and regulating measures and water erosion prevention.

JUSTIFICATION:
Freshet is accompanied by riverbed erosion, flood and destruction of national economy. Existing anti-freshet measures need further strengthening. In majority of rivers it is necessary to carry out the anti-freshet, riverbed regulating and other measures connected with prevention and liquidation of natural disaster consequences ensuring the accident free hater admission.
Water motion along the riverbeds is accompanied by erosion. In big and small, water-flows within the limits of spillway basin there is always hater erosion that is consist of the washing off of the soil fractions down the current. The most intensive erosion is taking place on the rivers where the bottom and the banks are of easy eroding soil. As a result the washout of fertile lands, destruction of national economy objects, is silting worsening of water admission by main canals. All this causes great damage to national economy and to liquidate this damage you need considerable measures concerning the beginning and liquidation of water erosion.

OBJECTIVES:
- Determinations of riverbed condition beside the water fence facilities
- Estimation of riverbed and big canals admission faculty, ensuring transport of drifts
- Choosing of the facilities type and arranging to prevent water erosion.
- To establish the riverbed and their basins condition and anti-freshet measures as well.
- To evaluate the water freshet formation.
- The choice of anti-freshet facilities type and arranging.
- Arranging of ant-freshet and regulating measures on the water objects.

COMPOSITION OF WORKS:
- Working out of technical terms to implement the project.
- Natural examination of some places of rivers and big canals of central

Asia.

- Working out of recommendations on struggle against drifts beside water fence from rivers.
- Studying of the work experience of anti-freshet measures.
- Working out of anti-freshet and riverbed regulating measures and measures on water objects.

ANTICIPATED OUTCOMES:

- Working out of improved methods of measures on struggle against drifts and of choice of reliable facilities of local materials to carry out the anti-freshet measures.
- Measures on water erosion prevention in rivers and big canals of CA, ensuring riverbed processes stabilization.

PLELIMINARY COSTS:
TENTATIVE COSTS 10 500 000 USD

DURATION:
2003 - 2007

PRIORITY TITLE
The program on struggle against natural disasters

PROJECT NAME: 4.5
Prevention, liquidation and reduction of damage from the effects of natural disasters

JUSTIFICATION:
The Central-Asian republics (CAS) are subjected to active impact of different natural calamities. Of 70 spreading all over the world dangerous natural phenomena almost half of it is in CAS. According to WMO data last years the numbers and effects of natural disasters including catastrophically floods and mudflows have increased.
Prevention and taking measures can reduce the natural disasters effects.
According to calculation for people suffering from natural disasters the morality factor in 30 minutes makes 0,12, in 1 hour - 0,34, in 12 hours - 0,68 and in 24 hours - 0,9 and more.

OBJECTIVES:
• Working out of measures on preventing, liquidation, reducing of damage regarding climate geographical economic conditions of the Aral Sea Basin.
• Division into districts according to the degree of subjection to natural disasters

COMPOSITION OF WORKS:
- The territory dividing into districts according to the degree of subjection to natural and hydro meteorological phenomena. Improvement of hydro meteorological observation system. Improvement of information system regarding the peculiarities of each region.
- Working out of technical and non-technical measures of flood prevention.
- Working out of medical sanitary-hygienic and anti-epidemic measures in natural hydro meteorological phenomena.

ANTICIPATED OUTCOMES:
- Reliable information on natural hydro meteorological phenomena (NHP) in special regions. Increasing of accurate prognostication of NHP. NHP monitoring improvement, prevention and reducing of

economic damage. Reducing of human victims, appearing of epidemic and spreading of infection diseases as a result of NHP.

PLELIMINARY COSTS:
TENTATIVE COSTS 240 000 USD

DURATION:
2003 - 2006

PRIORITY 5
Program on enhancement of regional social issues solution

PROJECT NAME: 5.1
Development of intersectoral economic co-operation on joint rational use by the CA countries water energetic and land resources

JUSTIFICATION:
Modern social economic conditions in the region are featured by poor intersectoral and interbrunch linkages at the state level.This facitator is one of the essential ones and demannds development of new approaches in water resources and energy management their integration into agricultral comlex as well as exploitation of irrigation facilities considering the needs of agricurtural sector and ecosystem demands.

OBJECTIVES :
Enhancement in development and signing of multilateral treaties in the framework of state initiatives on creation of water energetic agric and transportation consortiums with involvement of of investments of trnasnational companies and industrial financial groups

COMPOSITION OF WORKS:
• Search for solution at regional level of commonly prioritised problems in the outputs which hinders economic and social development of the region
• Mobilisation[of internal and external additional resources from finding solutions of the prioritised issues which under joint effort can be solved more successfully by CA countries that are at national level.

ANTICIPATED OUTCOMES :
Enhancement of development and signing of multilateral treaties the framework of interstate initiatives on creation of water and energy consortium, regional economic and technical co-operation among countries he participants and their integration into world economy

TENTATIVE COSTS
TOTAL : 600 000 USD

DURATION
Anticipated activities start 2003.
Anticipated activities completion 2010.

PRIORITY 5
Program on enhancement of solutions of region's social problems

PROJECT NAME: 5.2
Development the system of regional specialisation and co-operation in agric complex

JUSTIFICATION:
Population growth and reduction of productivity in agric sector represents now a serious threat to food security of CA region. Due to regional limitation of the agric lands in the basin of the Aral sea and exacerbating processes of degradation the problem of rationalized use considering agric aspect is a priority for CA region. Naturaly, growing needs in food require revision of the attitude to agric output and in a whole to conduct economic policy.

OBJECTIVES:
Development of the system of regional specialization and cooperation in agric complex cosidering the development of system of waterusers association in agric sector.

COMPOSITION OF WORKS:
- Enhancement of provision of food security in the region for the account of specialisation and co-operation in agric complex
- Needs identification of the region in manufacturing of food items

ANTICIPATED OUTCOMES:
Implementation of the perfect agric aggregates rational use of water resources water resource use in agric sector improvement of output in agriculture

TENTATIVE COSTS:
Total : 1 400 000 USD

DURATION
Anticipated activities start 2003 .
Anticipated activities completion 2010.

PRIORITY 5
Program on enhancement of social problems solution in the region

PROJECT NAME 5.3
Enhancement of the co-operation of the countries in the activities of international trade and economic organisation

JUSTIFIICATION:
At the modern stage one of the withholding factors in development of social and economic progress in the region is insufficiently close co-operation of the CA countries in the field of trade, scientific co-operation cultural exchange

OBJECTIVES:
Analysis and development of bilateral and multilateral trade and economic agreements.
Enhancement of regional co-operation in activities of international trade and economic organisation in spiritual sphere and formation of culture of SD. Support of regional scientific co-operation for SD

COMPOSITION OF WORKS:
component A)
elaboration of complex of measures for creation of favouring conditions on participation of the countries of the region in the activities of international trade and economic organisations
component B)
elaboration of complex of measures on removing of trade and economic and institutional handicaps for development of regional economic co-operation
(component C)
perfection of bilateral and multilateral trade economic agreements in CA
region component D)
Support of creation of regional scientific co-operation for finding solutions of the Aral sea basin and creation of regional informational space on scientific technical and social innovations in SD
component E)
preparation and distribution of the database of new technologies , goods and services for SD thearal sea basin
(component F)

formation of the mechanisms of attraction of private investments into regional innovative projects (pilot projects on implementation of mechanisms of attraction of private investments into culture)

(Component H)

studying of the world experience and exchange of the culture of SD of ecological traditions, support to ethnic culture and maintenance of cultural inheritance

ANTICIPATED OUTCOMES

Strengthening of regional co-operation, creation of favouring conditions on development of international trade and economic organisations Life quality improvement

TENTATIVE COSTS:

Total: 2 800 000 USD

DURATION:

Anticipated activities start 2004

Anticipated activities completion 2010.

PRIORITY 5
Program of enhancement of finding solutions for social problems of the region

PROJECT NAME 5.4
Development of regional transport infrastructure

JUSTIFICATION :
After obtaining independence in CA region occurred decentralisation in management in all brunches of transportation infrastructure. Due to that the collapse of whole system lead to destabilisation of goods exchange, diverting of economic interests, customs barriers between the countries , and sufficient increase of transportation services' and comsumers' goods cost.

OBJECTIVES :
Enhancement of the life quality improvement and poverty level decrease for the account of development of regional transportation infrastructure

COMPOSITION OF WORKS
- Enhancement of the activities of transportation infrastructure in the region
- Enhancement of the decrease .of the cost of transportation
- Enhancement of the road security provision
- Enhancement of customs procedures reduction

ANTICIPATED OUTCOMES
Increase of the passing ability of interstate road highways, perfection of interstate trade and economic connections. Decrease of the running costs ion transportation of consumers' goods and services .

TENTATIVE COSTS:
TOTAL: 1 500 000 USD

DURATION
Anticipated activities start 2003.
Anticipated activities completion 2010.

PRIORITY 5
Program on enhancement of finding solution of the social problems of the region

PROJECT NAME 5.5
Stabilisation of demographic situation in the region

JUSTIFICATION
Low life quality of the population, Malnutrition, insufficient medical service, improper for drinking water, dust and salt storms which are the outcomes of the violated ecological balance and degradation of the environment have lead to acute exacerbation of health status and life expectancy, birth rate, what is a sigh for a future demographic problem. Uncoordinated new forms of economic management , insufficient technical and financial means increase unemployment, poverty, destitution. Looking for better fate the population is migrating There emerges new type of migrants ecological refugees. Out of the areas which are in the deserted zone annual outflux of the population mounts up to hundreds of thousands of people Negative social economic processes in their turn activate process of desertion, land and plant resources are subjected to more and more exhausting exploitation .

OBJECTIVES:
Improvement of demographic situation in the region development of regional approaches and elaboration of national strategies

COMPOSITION OF WORKS:
Component A)
development of national and regional program for regulation of density of population at national and regional level
(component B)
management of regional migration processes at national and regional levels
component C)
development of the strategy of the preservation of the genetic fund of the Prearal nations

ANTICIPATED OUTCOMES :
Improvement of demographic situation in CA region.

TENTATIVE COSTS :
Total : 3 000 000 USD

DURATION
Anticipated activities start 2004.
Anticipated activities completion 2006.

PRIORITY 5
Program of enhancement of finding solution for the social problems of the region

PROJECT NAME 5.6
Development of educational programs on straightening of civil sector role

JUSTIFICATION
Education program of CA will be a component of joint programs of the subregion, directed on finding solutions of the formal education development success in CA . There is close connection of education, subregional "Program of concrete actions on improvement of environmental and socio-economic situation in the Aral Sea Basin for the period of 2003-2010" (ASBP-2) and CA initiative on sustainable development of CA.
It is important to note that in CA subregion has experience of implementation of programs in the field of education for SD .Important role plays in implementation of such kind of projects NGO of CA and their participation as partners is an essential and vital priority aspect .

OBJECTIVES
Enhancement of creation of subregional network on development of the educational system for SD in the countries of CA based on the principles of intersectotral and inter facility partnership

COMPOSITION OF WORKS:
(component A)
improvement of intellectual potential of specialists
(componnet B)
exchange of educational programs
(component C)
support of advanced systems of upbringing and its implementataion
componenet D)
pilot project on support of private invistments in education

ANTICIPATED OUTCOMES
- Strengthening of the role of the civil sector.
- Formation of the ideology of the new person considering SD of the region

- Evaluation of the status and perspectives of education
- Formation of database on methodology, organizations, experts
- Development of the networks of education and science.
- Creation of informational, methodological and training center.

TENTATIVE COST
Total: 220 000 USA

DURATION:
Anticipated activities start 2003.
Anticipated activities completion 2010..

PRIORITY TITLE

Improvement of material-technical and legal basis of regional organizations.

PROJECT NAME: 6.1

Improvement of material-technical basis of BWO "Sir Darya"

JUSTIFICATION:

The important condition for the effective work of interstate organizations the EC IFAS, ICWC (SIC, Secretariat, CMC, BVO "Amu Darya" and BVO "Sir Darya") and ISDC (SIC, Secretariat, REC) is to strengthen their material-technical basis.

It is necessary to strengthen the institutional capacity of interstate organizations including: coordination mechanisms, financial mechanisms, legal support mechanisms, monitoring process, training and education communication with other programs and public participation.

Immediate task is the improvement of regional information system and broadening its functions by means of new information levels (with transition from region to state area, separate irrigation systems) regarding the installation of IWRM, increasing in the volume and authenticity of information and reliability systems, broadening the number of information users, sustainable information volume, service etc. The important element of information development is the transition to integrated methods of management and providing the system with consultative capabilities.

According to the results of ASBP-1 the condition of material-technical hydroelectric stations of interstate significance doesn't meet the modern requirements. The means of water-calculation and communication are in bad technical condition. Equipment with automation means, processing and information keeping systems has the local character.

OBJECTIVES:

- Creation of institutional capacity.
- Strengthening the ASBP-2 monitoring.
- Strengthening the legal and financing status of interstate organizations, improvement of normative legal base and its application.
- Improvement in access of information and public participation.
- Consolidation of material-technical bases of interstate organizations.
- Development of TEJ on technical improvement of water resources of Amu Darya river basin management on the base of modern information

systems, automatic systems, dispatching and data collection, telecommunications and monitoring.
- Installation of information systems and SCADA.
- Improvement and development of regional information system.

COMPOSITION OF WORKS:
- Consolidation of material-technical bases of EC of IFAS and ICWC (SIC, Secretariat, CMC and BVO) and ISDC (SIC, Secretariat) in the sphere of information exchanges.
- Development of proposals on strengthening of legal and financial status of interstate organizations for the simple implementation of their activity in the territory of all the countries of Central Asia.
- Development of legal norms and rules of activity of interstate structures in their relations with state structures.
- Improvement of information data collection system, monitoring, analysis and management of water resources of rivers, basins and its transference into a modern platform of information database line "client-server", providing with potentialities of information-analytical service and consultative system, broadening its functions by introduction of new modules, models and widening theme limits and management levels to create integrated management systems to help make decisions.
- Installation on the system of modern technologies - informational DBSM, GIS, working out of web, etc.; increasing of potential information users, providing easy access to information, developing and strengthening of partner relations between information providers and consumers.
- Development of concepts on the improvement of Syr Darya and Amu Darya basin water resources management on the basis of modern information and automation systems, dispatching and data collection (SCADA).
- Equipment of the objects of BVO with means of constant control, automation, dispatching telecommunication and communication (SCADA).
- Institutional normative-legal and expert-technical support of ASBP-2, draft program monitoring, ecological education within the framework of the program.
- Analysis and interpretation of project results and development of decision-making system.

ANTICIPATED OUTCOMES:

- Legal norms and rules of activity of interstate structures in their relations with state structures.
- Worked out on the base of regional information system modern integrated information advising system having access to new information and taking decision levels and using new technologies of modeling and information processing.
- WEB-nets providing information change between IFAS organizations on all the aspects of its activity effective information access.
- Installation of SCADA system on the BWO objects.
- Working out of ASBP-2 realization mechanisms.

TENTATIVE COSTS

TOTAL 17 000 000 USD

DURATION:

2003 - 2010

PRIORITY 7

Development and realization of the regional and national programs of nature-conservative measures in the water flow formation.

PROJECT TITLE: 7.1

Development of hydro-glacious monitoring network in CA countries and glacier conservation (water flow formation)

JUSTIFICATION:

The glaciers are very important for CA republics, since they represent a source of fresh water for the region. Two basic water artery of Central Asia - the Amu Daria and Syr Darya rivers take the beginning in mountain ridge of Pamirs and Tien Shan, located in Kyrgyzstan and Tadjikistan.

One of the important tasks of water resources management is the understanding of processes, which influence on its forming. The existing natural fluctuations of weather and climate influence on glaciers properties. Also one of the reasons influencing on decrease of a glaciers mirror is the proceeding increase of anthropogenic influence and pollution of mountain ecosystems. The unavoidable consequence of these processes are the deep changes of a hydrothermal mode of mountain systems, so by glaciologist estimations the resources of mountain glaciers were reduced to one third for last 35 years.

OBJECTIVES

Study of dynamics changes factors affecting decrease of glaciers and develop measures to mitigate their negative impact.

COMPOSITION OF WORKS

(Component A)

Perfection and development of monitoring networks for state of glacier in the mountain regions of Tien Shan and Pamirs mountain ridges.

(Component B)

Discovering and basing of mechanisms glaciers melting due to reinforcement of aerosol factors.

ANTICIPATED OUTCOMES

- Development of hydro-glacious monitoring in the spurs of Pamirs and Western Tien Shan mountain ridges.

- Rehabilitation and improvement of monitoring networks for mountain ridges monitoring in the spurs of Pamirs and Western Tien Shan mountain ranges.

TENTATIVE COSTS
Total: 1 350 000 USD

DURATION
Estimated date of work start 2003
Estimated date of work end 2010

PRIORITY 7

Development and realization of the regional and national programmes of environmental measures in the area of water flow formation

PROJECT TITLE: 7.2

Mitigation of risk of disasters in vulnerable mountain regions of Central Asia

JUSTIFICATION:

The mountain areas are exposed both to nature disasters (earthquakes, landslide, avalanche, mudflows, floods and etc.), and to man's impact (disafforestation, over pasture, improper economical activity, air and ground pollution, from polluted plains and industrial activity in the mountains).

most vulnerable threat peculiar to seismically active mountain zones, which is situated at the crossing of one of the biggest geological structures in the world - mountain ridge Pamirs and Tien Shan. Annually there have being registered more than 10000 earthquakes of different strength, and also more than 100000 landslides, thousands of avalanches, destroying mudflows and floods. Scale and negative impact of such phenomenon is increasing with intensification of antropogenic influence on mountain regions.

Irrational land use and fatal human activity could intensify the negative influence of earthquakes, as in case of Gissar Earthquake in Tajikistan in 1999. At the same time the terracing in agricultural purposes, widespread in the Central Asian mountain region destabilizes mountainsides and promotes landslides. More than 30% of mountainsides in Central Asia are under the threat of landslides.

Besides that, seismologists of Central Asia consider hydro-technical constructions, such as water reservoirs, constructed in one of the most seismically active zones of the region, could change seismic structure in immediate proximity and to increase the risk of seismic activity along the fault system, where the reservoirs situated.

Undoubtedly, this is impossible to prevent disastrous nature phenomenons. But They could be brought to minimum by means of thorough planning of human activity in the region.

OBJECTIVES

Development of package with the aim of bringing to minimum the disaster's (earthquakes, landslide, avalanche, mudflows, floods and etc) in the Central

Asian mountain region

COMPOSITION OF WORKS

(Component A)

recommendation for the prevention, liquidation and decrease of damages from consequences of nature disasters

(Component B)

development of methods of the short-term forecast of flood

(Component C)

introduction of measures directed on prevention of water erosion

(Component D)

realization of bank protection, reconstruction and construction mud dams

(Component E)

the pilot projects on protection of the settlements, subjects to a long time influence mudflow- flood water

ANTICIPATED OUTCOMES

- Protection of economies, lands and population from dangerous heodinamic process affects;
- Development and improvement of legislative, normative and economic instruments on nature resources use and CA mountain territories protection;
- Reabilitation of degradated mountainous ecosystems in the zones of intensive nature use.

TENTATIVE COSTS

Total: 3 750 000 USD

DURATION

Estimated date of work start 2003
Estimated date of work end 2010

PRIORITY TITLE
Development and implementation of the Regional and National Programs on rationalization of water use in economic branches of Central Asian countries.

PROJECT NAME: 8.1
Development and implementation of water savings projects.

JUSTIFICATION:
Development and implementation of water saving programs in CA regions is one of the more priority directions, deciding simultaneously the questions of raising the agriculture productivity, rehabilitation and environment protection, improvement of collector-drainage systems, decreasing water resources deficit.

OBJECTIVES:
Propaganda and introduction of new water saving systems in water sector of CA region. Development of water saving programs. Pilot projects and their economic justification.

COMPOSITION OF WORKS:
Subproject 1.1
Creation and support of water WEB-sites of the Central Asian Republics.
Subproject 1.2
Creation of consulting services to increase the productivity of water/land use in irrigation farming of the Aral Sea basin as a base of steady economic development of the CA states.
Subproject 1.3
Development of projects and implementation of pilot water saving projects (two in each state).
Subproject 1.4
Development and implementation of pilot projects on reconstruction of rice and non-rice irrigation systems regarding the variety in productivity increasing factors of irrigation lands and water savings in the lower reaches of the rivers of Kazakhstan and Uzbekistan.

ANTICIPATED OUTCOMES:
Raising the effectiveness of water resources use in agriculture and in other

branches of CA economy.

TENTATIVE COSTS

Subproject 1.1	300 000 USD
Subproject 1.2	2 000 000 USD
Subproject 1.3	5 300 000 USD
Subproject 1.4	25 200 000 USD
Total:	32 800 000 USD

DURATION:
2003 - 2008

PRIORITY TITLE
Development and implementation of the Regional and National Programs on rationalization of water use in economic branches of Central Asian countries.

PROJECT NAME: 8.2
The river Vakhsh water flow regulation by the Nurek water reservoir regarding the flood-landing tugai reserve "Tigrovaya balka".

JUSTIFICATION:
The normal functioning of the "Tigrovaya balka" reserve was due to annual flood of its territory during the freshet period. The building of the Nurek hydroelectric station with water reservoir of 10,5 km3 changed the natural regime of the river Vakhsh. As a result the freshets were abruptly reduced and such floods were stopped. At the same time the Nurek HES brings about fresh-running water escapes in the volume of about 2 km3 but in non-optimum "Tigrovaya balka" reserve regime such water use in normal vital activity.

OBJECTIVES:
Improvements in the Nurek HES regime and development of the technical measures project for the rehabilitation of "Tigrovaya balka" reserve.

COMPOSITION OF WORKS:
1. Analysis of the effectual Nurek reserve regimes.
2. Determination of water use regime of "Tigrovaya balka" reserve.
3. Development of the Nurek reserve regime, ensuring the agreement irrigation and energy interests of the Republic of Tajikistan and of the region, regarding the "Tigrovaya balka" reserve needs.
4. Development of technical project measures.
5. Holding of joint consultations and preparation of interstate agreements

ANTICIPATED OUTCOMES:
Rehabilitation of the flood-landing tugai reserve "Tigrovay balka".

TENTATIVE COSTS
Total: 115 000 USD

DURATION:
2004

PRIORITY TITLE
Development and implementation of the Regional and National Programs on rationalization of water use in economic branches of Central Asian countries.

PROJECT NAME: 8.3
Integrated water resources management in the Aral Sea Basin.

JUSTIFICATION:
In the Aral Sea basin it has become necessary to pass from administrative-territorial water resources system management to integrated management. There must be understanding that the point is hot in common interstate water resources system management but only in integral uniform approach to the improvement of the common structure within the water state management regarding the reservation and development of national system management at all the levels.

OBJECTIVES:
To introduce in pilot objects of difference hierarchy levels (irrigation system, water users association, water economy) integrated water resources management in hydrographic principle (organizing and technical measures). To display the integrated water resources management advantages from the point of view of normal exploitation of all the irrigation system sections, evenness of water supply for all water users and raising of water productiveness.

COMPOSITION OF WORKS:
To choose pilot objects irrigation system, water users association, water economy. To implement the following measures on the chosen pilot objects.

ANTICIPATED OUTCOMES:
1. New organization structure of water-economy boards with public to implement integrated water resources management within the hydrographic framework on pilot objects in the lower reaches of Amu Darya and Syr Darya (irrigation system).
2. Legal base for the realization of IWRM as the package of regulating documents.
3. Development Communications on pilot objects, information system in

connection with mathematical models organized training and raising the level of skill system.

4. Guaranteed and equal water distribution system, on different management levels (system-channel, АВП-хозяйства) tested on pilot objects.

TENTATIVE COSTS:
Total: 1 750 000 USD

DURATION:
2004 - 2006

PRIORITY TITLE

Development and implementation of the Regional and National Programs on rationalization of water use in economic branches of Central Asian countries.

PROJECT NAME: 8.4

Building of the main drainage collector and closed horizontal drainage in microregions 21,22,23 of Nukus

JUSTIFICATION:

Nukus Sity is the biggest administrative industrial cultural center of the republic of Karakalpakistan . The canal Kuzketken is the main irrigation source of northern

Files of the republic , the canal springs 9 km south from Nukus. The highest level of subsoil on the sections of relief lowering .The close bedding of subsoil

waters to surface leads to sinking of buildings , second salinization of sail and quiche obsolescence of underground engineeriry communications.

Snitching leads to worsening of ecological condition of the inhabited territory and asa consequence to green plantations destruction.

The territory of the city belongs to right bank alluvial Amudarya river. Poor permeability of natercontaining rocks and small rakes of subsoul waters lead to the fact that basically there is plan waste by evaporation and transpiration and insignificantly by outflow to thegeneral flow .

Sinking connected with it leads to worsening of ecological condition of the inhabited territory as a couseguence to green plantation destruction.

OBJECTIVES:

Building of the main drainage collector and horizontal drainage necessary for prevention from raising subsoil water level higher that critical , draining the water beyond the city and improvement of soil quality land - reclamation.

COMPOSITION OF WORKS:

- Prospecting
- Development of project
- The main collector building

The horizontal drainage building

ANTICIPATED OUTCOMES:

- Reducing in soil salinization
- Extending in the term of exploitation of subground engineering communications
- Improvement of soulquality land - reclamation condition for planting of greenery

TENTATIVE COSTS

Total: 3 550 000 USD

DURATION:

2003 - 2007

PRIORITY 9

Elaboration and implementation of the international program of the sanitation and ecological rehabilitation of the populated areas and natural systems of the Aral Sea area.

PROJECT NAME 9.1

Assistance in implementation of the national pilot projects on providing the population with clean drinking water.

JUSTIFICATION

One of the factors determining the state of health and life rate of the people is access to the qualitative drinking water and adequate sewerage. Now the population of the region suffers from the low level of service in water supply in terms of both quality and quantity of the drinking water provided. Besides, the rate of the morbidity from water related diseases increases. Now considerable parts have the water and sewerage systems available in the region need to be either replaced or repaired.

OBJECTIVES

Promotion to the introduction of mechanisms leading to the institutional reforms facilitating the implementation of the "Clean water" programs on the whole territory of the Aral Sea basin with the involvement of the private sector. These changes are also aimed at the improvement of the existing capacities efficiency, through providing for the needs of the populated areas in water both in sufficient amount and proper quality by the profitable and effective way on regular basis.

COMPOSITION OF WORKS:

- Support of the arrangements aimed at the reconstruction and construction of the local water nets through the use of local water sources on the effective basis.
- Promotion to the introduction of the modern technologies of drinking water cleaning.

ANTICIPATED OUTCOMES

Implementation of the national programs on providing the population with clean drinking water. Reduction of the waste level at the expense of local leakages in the water supply systems (here will be included the nets of

water collection distribution of drinking water and collection of sewerage water, pumps stations and stations of sewerage water disposal).

TENTATIVE COSTS
Total: 3 000 000 USD

DURATION:
Anticipated activities start 2004
Anticipated activities completion 2010

PRIORITY 9
Elaboration and implementation of the international program of the sanitation and ecological rehabilitation of the populated areas and natural systems of the Aral Sea area.

PROJECT NAME 9.2
Perfection of the system of prophylaxis of the diseases in the ecologically crisis zones.

JUSTIFICATION
With the reduction of the level of socio-economic situation of the population of the Aral Sea area as a result of the ecological crisis affects, the number of the morbid population has increased. Thus lately by the data of the "Medicine suns frontiers" organization only annual growth of the tuberculosis morbidity rate is 35-40%.

OBJECTIVES
Identification of the morbid people at the early stages of the disease through total regular medical check-up of the population, especially in rural areas and X-raying the patients with mobile X-ray equipment.
Creation and introduction of the system of monitoring of the diseases spread in the crisis zones of the Aral Sea.

COMPOSITION OF WORKS:
(component A)
perfection of the diseases prophylaxis system.
(component B)
perfection of the methodology of monitoring of the surroundings (water, air, soil and food products) and diseases.
(component C)
support of the arrangements aimed at the production of the vital important medications in the region.
(component D)
control and assistance to the health care system personnel in the realization of the projects on providing the population with qualitative drinking water.

ANTICIPATED OUTCOMES
- Early identification of the morbid people will allow decreasing the

mortality level of the population in the zone of ecological disaster.

- Conducting total regular medical check-u of the population and prophylactic measures will decrease the mortality.

TENTATIVE COSTS
Total: 7 000 000 USD

DURATION:
Anticipated activities start 2003.
Anticipated activities completion 2010.

PRIORITY 9
Elaboration and implementation of the international program of the sanitation and ecological rehabilitation of the populated areas and natural systems of the Aral Sea area.

PROJECT NAME 9.3
Regional arrangements on providing with medications of vital importance.

JUSTIFICATION
Donor blood service is one of the important links in the health care system of any state and effective treatment of heavy patient of various profiles depends on its efficiency. At present donor blood service meets only minimum needs of hospitals and can't produce necessary minimum reserve of components and preparations of blood, let alone in cases of natural disasters, catastrophes and other emergency situations.
The scale of the Aral crisis and its protracted consequences negatively affected the health of the population in the region. For the last 10 years anemia morbidity among the population has increased by 550 times, cases of stones in the bladder - by 30 times, a high level of infectious diseases is marked. The use of infusion solutions.

OBJECTIVES
- Support of the development of the pharmaceutical industry on the local level.
- Assistance in continuous and timely provision of the Aral region population with components and preparations of blood of vital importance.
- Assistance in providing for health care institutions and population of the ecological crisis zone with qualitative and cheap infusion solutions.

COMPOSITION OF WORKS:
- The construction of the infusion solutions plant in Nukoos city with the annual capacity of 360.0 thousands of liters.
- Provision of the blood preparations production considering the increase of the amount of raw material for processing through conducting repair and reconstruction, starting and adjustment works, including acquisition of the lacking equipment and expandable materials.

ANTICIPATED OUTCOMES

Improved provision of the Aral Sea area population with qualitative medications:

- Higher control level over the blood components and preparations.
- Introduction of advanced production technologies of processing and output of blood preparations.
- Provision and access for the Aral Sea area population to qualitative blood components and preparations.
- Provision of hospitals and population of the ecological crisis zone with qualitative blood components and preparations.

TENTATIVE COSTS

Total: 10 000 000 USD

DURATION:

Anticipated activities start 2003.
Anticipated activities completion 2010.

PRIORITY 9
Elaboration and implementation of the international program of the sanitation and ecological rehabilitation of the populated areas and natural systems of the Aral Sea area.

PROJECT NAME 9.4
Elaboration of the strategy of preserving the genetic fund of the Aral Sea area peoples.

JUSTIFICATION
Health of people depends on the state of environment, including clean water, garbage disposal and availability of a sufficient amount of healthy food. Among the indicators, characterizing the state of health of the Aral area people are those of children's mortality and expected length of life, reduction of the population growth. Compared to 1992 infant mortality and mortality among children under 5 years old has decreased in all Central Asia region countries, the Aral area including such dynamics was caused first of all by a sharp decline in birth rate. At the same time absolute indicators remain very high - practically each 50th child out of 1000 newborns doesn't survive to the age of 1 year and every 30th - to the age of 5 years old. The majority of the Aral area people due to unemployment, poor living conditions, diseases, poverty, have no means to improve their health or social status. These factors considerably tell on the weakening of the immune system, as well as lead to aggravating changes of the genetic heredity among people with patalogical complications.

OBJECTIVES
Conducting genetic monitoring of the Aral area peoples.

COMPOSITION OF WORKS:
Elaboration of regional approaches and national strategies on preserving the genetic fund of the Aral Sea peoples.

ANTICIPATED OUTCOMES
Monitoring of the changes in the genetic heredity among the Aral area population.

TENTATIVE COSTS
Total: 1 500 000 USD

DURATION:
Anticipated activities start 2003.
Anticipated activities completion 2006.

PRIORITY 9
Elaboration and implementation of the international program of the sanitation and ecological rehabilitation of the populated areas and natural systems of the Aral Sea area.

PROJECT NAME 9.5
Development of the system of voluntary certification of output and production.

JUSTIFICATION
Nowadays agricultural production produced in the countries of the region doesn't meet world standards of quality, first of all, due to insufficiently developed system of certification and standardization in Central Asia countries. The lack of economic leverages of stimulation discourages producers from producing ecologically clean, certified agricultural production.

OBJECTIVES
Elaboration of the program of agricultural production development through the use of technologies for high quality processing and certification of agricultural production.

COMPOSITION OF WORKS:
(component A)
support of the ecologically oriented medium and small business development.
(component B)
development of the system of voluntary certification of the output and production.

ANTICIPATED OUTCOMES
- Introduction of the world ecologically standards and coming onto the markets of the "green production"
- Introduction of advanced technologies for the processing of the agricultural raw materials.
- Introduction of ecologically clean technologies into agriculture.

TENTATIVE COSTS
Total: 3 000 000 USD

DURATION:
Anticipated activities start 2003.
Anticipated activities completion 2010.

PRIORITY 9

Elaboration and implementation of the international program of the sanitation and ecological rehabilitation of the populated areas and natural systems of the Aral Sea area.

PROJECT NAME 9.6

Development of the mountainous territories infrastructure and ecotourism.

JUSTIFICATION

In general, one of most acute problems in the complex of mountainous territories is the problem of ensuring a man's sustainable activity in the mountains. Harsh natural conditions combined with the danger of hazardous phenomena - is one of the main limiting factors of the economy development of the mountainous territories. The situation becomes still worse due to the fact that natural limitations and imperfection of the system of management of the mountainous settlements development combined with poor transportation communications and their costly exploitation, especially in wintertime, practically excludes the possibility for the development of the processing industry based in mountainous settlements. Due to this factor the labor efficiency profitability of the agricultural production in the mountains is considerably lower compared with that in the valleys. The natural character of economy in the mountains can ensure only low living conditions. In fact, economies that formed in scattered mountainous settlements with the same expenditures of labor and material resources receive much less total profit compared to the similar economies in the valleys. Besides, one of the ways to increase the well-being of people in mountainous areas are colossal resources for the development of infrastructure of sanatoria and health resorts treatment as well as ecological tourism.

OBJECTIVES

For the successful solution of the mountainous population problems is linked it is necessary to devise a complex of measures. Among them the priority ones are:

- Development of transport communications and insurance of their sustainable all the year functioning.
- Elaboration of the scientifically based legal norms for the protection of the mountainous population rights and health, including a complex of

compensating measures.

- Legal measures for a broader participation of the mountainous population in the management of mountainous resources and development of mountainous territories.
- Priority development of social infrastructure, capable of bringing closer the living conditions in the mountains to the life standards of the population from the valley territories.

COMPOSITION OF WORKS:
(component A)
elaboration and support of national and regional arrangements on the complex infrastructure development in mountainous region.
(component B)
support of ecotourism development in mountainous regions.

ANTICIPATED OUTCOMES
Achievement of consensus among all the structures dealing with solution of mountainous areas problems in terms of the regional approach to the issue of the sustainable development of mountainous territories.

TENTATIVE COSTS
Total 2 000 000 USD

DURATION:
Anticipated activities start 2004
Anticipated activities completion 2010

PRIORITY 9
Elaboration and implementation of the international program of the sanitation and ecological rehabilitation of the populated areas and natural systems of the Aral Sea area.

PROJECT NAME 9.7
Assisting people to adapt to market conditions.

JUSTIFICATION
Aggravating crisis of the Aral Sea and its protracted consequences tell badly on the socioeconomic situation of the Aral area population. The aftermaths of the severest lack of water of 2000-2001 made this situation still worse. By the research conducted by foreign experts the damage caused by the ecological crisis to the economy is 200,0 million US dollars worth. Official unemployment rate doesn't reflect real situation because it show only the number of people registered at the labor market. Besides, it doesn't consider people involved in unofficial economic sector and "latent" unemployment. This project will promote entrepreneurship among the unemployed through providing privileged microcredit.

OBJECTIVES
Elaboration and introduction of the program on microcrediting for marking active entrepreneurship as a base on social research and trainings.

COMPOSITION OF WORKS:
- Promotion of the entrepreneurship development on the regional level.
- Support of the priority directions in small and medium business on national and regional levels.

ANTICIPATED OUTCOMES
Improvement of the population's well-being, creation of jobs.

TENTATIVE COSTS
Total: 3 000 000 USD

DURATION:
Anticipated activities start 2004
Anticipated activities completion 2007

PRIORITY 9
Development and implementation of the international programme on hygienic-ecological improvement of the populated area and natural eco-systems of Aral Sea region

PROJECT NAME: 9.8
Conservation and restoration of tugai and pasturable lands in deltas of the Amu-Darya and Syr-Darya Rivers

JUSTIFICATION:
Development of the irrigated agriculture in the Aral Sea basin unexampled by their scale and terms for the modern history has exceeded the eco-system possibility and leaded to its destruction with the catastrophic consequences. Especially the saxaul and flood-land forests (tugai) used for agricultural pastures have been undergone to the greatest strict anthropogenous pressing. Only in flood-land of the Amudarya river the forest area has been decreased from 150 thousand ha to 22-23 thousand ha for the last decades. This process is continued in present time. Destroying the hydrological regime of rivers causes the strong degradation of tugai forests. Diversity of Central Asian flora and fauna species and their abundance depends on eco-system state. Eco-system destruction resulted to the significant decrease of biodiversity.

OBJECTIVES:
Development of actions on conservation and rehabilitation of tugai forests and pasturable lands in deltas of the Amu-Darya and Syr-Darya rivers

COMPOSITION OF WORKS:
(component A)
restoration of the plant covering of deltas of the Amudarya and Syrdarya rivers by using the domestic flora (plants) to create an opportunity to develop the cattle-breeding
(component B)
conservation and restoration of tugai forests in river basins as a factor of improvement of Pri-Aral eco-systems.

ANTICIPATED OUTCOMES:
Restoration of delta eco-systems. Conservation of bio-diversity and natural covering

TENTATIVE COSTS:
Total: 1 350 000 USD

DURATION:
Estimated date of work start 2003
Estimated date of work end 2008

PRIORITY 9
Development and implementation of the international programme on hygienic-ecological improvement of the populated area and natural eco-systems of the Aral Sea region

PROJECT TITLE: 9.9
Development of measures on prevention of salt-dust transfer from the drained Aral Sea bottom

JUSTIFICATION:
The division of the Small sea from Large happened in 1985 - 86 years, at the level 41 abs. м, it has resulted in formation of new deserted territory with salts sediments in the top layer up to 1 billion tons. Stirring up of ash processes and carrying-over salts and dust from the drained Aral Sea bottom became one of the main criteria deterioration of bordering cultural zones. The experimental field researches of the scientists have shown that, huge quantity of salt and dust from the drained sea bottom are transferred on distance up to 500-600 km.

OBJECTIVES
- Prevention of carrying-over salts and dust from the drained Aral Sea bottom
- Detailed investigation of ground waters, top-soil of drained bottom
- Application of phyto-reclamation works on the drained Aral Sea

COMPOSITION OF WORKS
Development of well-grounded measures for prevention of carrying-over salts and dust from the drained Aral Sea bottom .
Investigation, mapping, zoning of the soil of the drained Aral Sea bottom for its use

ANTICIPATED OUTCOMES
Fixing of drained Aral Sea bottom. Determination of carrying-over salts and dust

TENTATIVE COSTS
Total: 3 000 000 USD

DURATION
Estimated date of work start 2003
Estimated date of work end 2008

PRIORITY 9

Development and implementation of the international programme on hygienic-ecological improvement of the populated area and natural eco-systems of Pri-Aral regioan

PROJECT TITLE: 9.10

Development and realization of measures on decrease of the level of transboundary pollution of atmospheric air

JUSTIFICATION:

Ambient air is one of the most important components of environment. Its functions are life support, climate and temperature control, protection, energy supply and others.

Pollutants from natural and man-made sources and also physical-geographical and climate conditions contribute to atmospheric pollution. Natural sources of air pollution in Central Asia region are Kara Kum and Kyzyk Kum deserts and also dry ground of the Aral Sea. Masses of salty dust are blown up from the dried surface and carried from the West to the East.

More than 7 million ton of contaminants from industrial and transport sources of the five countries polluted atmosphere in 1999.

Maximum total pollutant emissions of 43.7 per cent falls at Kazakhstan, then follows Uzbekistan with 31.4 per cent; Turkmenistan - 19.9%, Kyrgyzstan - 3.3% and Tajikistan - 1.7%.

Analysis of types of enterprises in the region and content of pollutant emission showed that enterprises of fuel and energy complexes as well as oil and gas sectors are the most significant producers of such pollutants as sulfur dioxide and untreated hydrocarbons. Fuel and energy complex is the basic source of emission of sulfur dioxide and methane which originate greenhouse effect leading to global climate changes. Mining and metallurgical enterprises are also big sources for air pollution with gaseous impurities and heavy metals. Enterprises of chemical industry are sources of specific contaminants - dust of ammonium nitrate, nitrogen oxide, ammonia, phenol, organic solvents. Construction industry and cement producing manufactures are main sources of dust.

Basic cause of high level of air pollution by industrial enterprises is low efficiency of waste disposal plants facilities. Obsolete dust - and gas-treating plants provides 30 pe cent of gas-dust recovery on average. Besides,

industrial technologies do not meet current requirements and need to be replaced..

Taking into account adopted plans of economic development of the countries and keeping obsolete material and power-consuming industries, its is expected peaking of air pollution problem

Motor transport negatively impacts on environment, increasing every year contribution into air pollution in the region. Fleet of cars is steadily increased. In big cities of Central Asia countries 60-90 per cent of total emissions is caused by vehicles. Means of transport account for emission of 90% of nitrogen oxides, 70% of carbon oxides and nearly 1005 of volatile hydrocarbons. .

OBJECTIVES

The study of package with the purpose of decrease of a pollution level of atmospheric air and its influence on environment and includes:

- The development of the regional register of emissions and transfer of pollutant (CAR RETP).
- The inventory of emissions of resistant organic pollutants sources
- The monitoring of emissions of polluting substances.

COMPOSITION OF WORKS

(Component A)

" The development of the regional register of emissions and transfer of pollutant" (CAR RETP) assumes the development of the regional registry of emissions and moving of polluting substances, assessment of transboundary moving of polluting substances and caused economic damage, improvement and modernization of existing system of emissions monitoring. The statistical information assembled in the registry should be used for the further research and development in the field of atmosphere protection.

(Component B)

" The inventory of emissions of resistant organic pollutants sources " assumes inventory and monitoring of sources and chemical structure of emissions of resistant organic pollutants, and also development of the plan of actions on reduction of emissions ROP.

(Component C)

" The monitoring of emissions of polluting substances " consists in creation of monitoring system of polluting emissions substances at the large industrial enterprises taking into consideration the transboundary aspects,

and also development of the actions plan on introduction of advanced technologies on cleaning and reduction of emissions, and also processing and filtration of wastes.

ANTICIPATED OUTCOMES

- Improvement and harmonization of air protection legislation and standards in accordance with International standards and requirements.
- Modernization of monitoring network for transboundary transfer of pollutants and improvement of system of pollutant emission control..
- Conducting joint research projects and surveys on air protection, creation of system of on-line exchange with information and computer databases.
- Establishment of regional network for coordination of office actions on ozone layer.
- Identification of sources of emission of resistant organic contaminants in Central asia countries (in the framework of Stockholm Convention on resistant organic contaminants
- Assessment of trans-boundary transfer of contaminants and economic damage in the framework of ЕМЕП Programme. (in the framework of The convention on trans-boundary long-distance air pollution).
- Application of non-traditional energy sources.

TENTATIVE COSTS

Total: 1 900 000 USD

DURATION

Estimated date of work start 2003
Estimated date of work end 2010

PRIORITY 9
Elaboration and implementation of the international program of the sanitation and ecological rehabilitation of the populated areas and natural systems of the Aral Sea area.

PROJECT NAME 9.11
Construction of a fish hatchery in Muinak area.

JUSTIFICATION
Fish breeding has been the main industry in Muinak area. Fish breeding industry made more than 80% of the production of this area. At present the Aral Sea has lost its fish breeding importance and as a result of the severest lack of water in 2000-2001 all lakes in the delta of Amu-Daria river which led to the total loss of the bulk of real incomes of the population in this area and fish reserves. As a result of the implementation of the project "Construction of local water reservoirs along the sea cost line in the Amu-Daria delta" in 2002 there was set a base for the fish breeding activities, reservoirs with the territory of 37,8 thousands of hectares.

OBJECTIVES
Creation of special pools farmings for breeding young fish of valuable fish species. Creation of fish hatchery is to take place in Muinak area. Water supply will be done from Mezhdurechensk water reservoir, along the Marinkin-uziak canal. The implementation of the project will make it possible to increase the volume of the fish production, improve its sort composition, which to a considerable degree will ensure the development of the fish farming and create new jobs.

COMPOSITION OF WORKS:
- Compiling of the project and estimates documentation.
- Reconstruction of the existing pools and acquisition of the necessary equipment.
- Purchase of the young fish of the valuable fish species.

ANTICIPATED OUTCOMES
- Creation of a fish hatchery for breeding the young fish of valuable fish species.
- Increased fish production, even in the years of water deficit, with the improvement of its sort composition.

TENTATIVE COSTS

• capital investments into the rehabilitation of the fish hatchery and acquisition of equipment - 200 000 USD

Exploitation expenses for the first 2 years - 80 000 USD

Total 280 000 USD

DURATION:

Anticipated activities start 2003.

Anticipated activities completion 2008.

PRIORITY 10

Development of the International Programme on Environmental Sustainability Restoration and Biological Productivity

PROJECT NAME: 10.1

Waste Management and Reduction of Their Negative Effect on Transboundary Water-Currents of Central Asia.

JUSTIFICATION:

Analysis of the current state of waste requires the account of general changes in economy. Since 1991 economic recession has begun in the region republics and it was stopped only after 1995. This recession was accompanied with the structural changes and basically was featured by faster declining in industry and relative swift growth in the field of trade and services. To be pointed, this recession was on the JUSTIFICATION of permanent population growth (in spite of increased migration from republics) and able-bodied citizens growth at the same time, otherwise it is mainly explained by diseases of republic transfer to the market economical relations. The state analysis revealed the next main problems, as follows:

- there are no dust-processing plants in region;
- domestic waste storages rarely meet sanitary requirements;
- lack of centralized areas for industrial toxic waste disposal;
- lack of classification on waste structure;
- there are practically no low-waste and non-waste technologies on waste utilization and reuse;
- there are no measure to eliminate potential dangerous of nuclear-waste disposal and metallurgy industry waste accumulated before.

In republic there are over 130 objects with mining waste with radio nuclides, heavy metals (cadmium, lead, zinc) salts harmful for health and toxic substances used as reagents during minerals and ores processing and enriching.

There are huge quantity of the mechanically crushed rock dumps and unconditioned ores with tailing dumps that depend on wind, water and gravitation forces. Ashes and ash-and-slad waste of the energetic complex have the biggest volume among other industry fields.

Lack of planned and supposed industry and agriculture development led to spontaneous dissemination of individual and private construction plots with violation of functional and planning organization of urban

environment that takes into account environmental specifics.
In spite of population and small and medium business enterprises growth imported waste quantity is decreased in recent years due to deterioration of waste collection system function and areas capabilities. Simultaneously, strong growth observed in agriculture causes waste volume growth and these waste, as a rule, are mainly utilized as fodder or organic fertilizations in agriculture itself.

OBJECTIVES

Study of a complex of measures on level increase of minimization and recycling of waste products in Central Asia region including. Umbrella project includes number of components of regional character:

- Development of the regional programme "Waste management"
- Maintenance of ecological safety of Syr Darya, Amu Darya, Zaravshan, Chu river basins under transboundary tailing dump effects and rocky dumps
- Creation and expansion of capacities on recycling the firm industrial waste products placed in transboundary river basins
- Development of a regional network of the Centres for Cleaner Production (CP)

COMPOSITION OF WORKS

(Component A)

"Development of the regional programme "Waste management for Central Asia contries" is aimed at preparation of the programme on increase of ecological safety of existing ranges, a industrial wastes burial place and also on creation of monitoring on moving waste products to region. Within the framework of a component the regional committee (centre) establishing is supposed for preparation of offers on process completion of signing and ratification of the Basel Convention.

(Component B)

"Maintenance of ecological safety of Syr Darya, Amu Darya, Zaravshan, Chu river basins under transboundary tailing dump effects and rocky dumps" is designed for reduction of mining industry waste products affects on a level of transboundary water pollution and includes:

- Assessment and inventory of state of tailing dumps, rocky dumps and their affect on environment;
- Development of a regional environmental action plan of ecological

safety of transboundary river basins, improvement of mining industry waste products processing.

(Component C)

"Creation and expansion of capacities on recycling the firm industrial waste products placed in transboundary river basins" assumes conducting inventory of ranges and an ecological assessment on a burial place of the industrial wastes representing threat to transboundary water-currents. Preparation of recommendations for development and introduction of technologies of neutralization and processing of toxic waste products and ranges on industrial wastes burial place in sphere of ecological safety.

(Component D)

"Creation of a regional network of the Centres for Cleaner Production (CP)" includes creation in CAR networks of the centres of non-polluting production (NPP) for exchange with experience on resource saving, efficiency of waste products recycling and processing with using low-wasted and non-wasted technologies, pilot projects launching.

ANTICIPATED OUTCOMES

- Joining process completion and Basel Convention ratification in the region;
- Development of the waste management regional programme for determination of policy, legal regulation, normative and methodic ensuring, statistical reports. Etc in this field;
- Establishing the regional network and supporting Clean Industry (Technology) Centers activity;
- Inventory of sites of transboundary production and consumption waste disposals distribution in region;
- Setting up conditions for public community involvement to decision-making problem and ensuring its broad information in the field of waste management;
- Non-waste and low-waste technologies and CPT implementation into production;
- Increasing use of the modern ways of re-utilisation of mining and energetic industries waste;
- System of separate collectionof firm household waste products and their processing;
- Ensuring development and implementation of technologies on toxic waste neutralization and re-process;

- Establishing centralizing areas on non-utilizing waste disposals;
- Rehabilitation of territories with nuclear and other dangerous waste;
- Conducting the regional register of waste migration.

TENTATIVE COSTS
Total: 1 900 000 USD

DURATION
Estimated date of work start 2003
Estimated date of work end 2010

PRIORITY 10
Development of the international programme on restoration of environmental sustainability and biological production

PROJECT NAME: 10.2
Analysis of restoration capacities for near-water ecosystems of Amu Darya river by means of application of sustainable use of water resources in cotton-growing.

JUSTIFICATION:
The big number of CA countries flora and fauna species diversity are in direct dependence on state of near-water eco-systems, destruction of which led to considerable bio-diversity decreasing.

OBJECTIVES
Development and implementation of measures on practical applying water-use technologies

COMPOSITION OF WORKS
Carrying out modeling projects on practical applying optimal water-use technologies with re-addressing water reserves appeared for near-water eco-systems restoration, that in turn will be an essential water-protection factor.

ANTICIPATED OUTCOMES
Near-water systems protection and restoration

TENTATIVE COSTS
Total: 1 000 000 USD

DURATION
Estimated date of work start 2003
Estimated date of work end 2006

PRIORITY TITLE 11
Development of the concept on sustainable development in the Aral Sea basin

PROJECT NAME 11.1
Development of intersectoral economic cooperation on joint rational use by CA countries water energetic and land resources

JUSTIFICATION:
One of the priority directions of the "…2003-2010." was adopted development of the Conception of sustainable development of the Aral sea basin. Such a resolution was connected to the fact that major goal of. -2 is to prevent social economic crisis, can be achieved only in the frame work of the policy of sustainable development (SD) In Nukuss 1995, Issyk Kul 1995 Alamaty 1997, Ashgabad 1999,Dushanbe 2002 declaration of the countries of CA was declared transition to the policy of sustainable development, complex and many branches approach, ecosystem and integrated management of the natural resources and water economic activities. In the summit in Johannesburg (2002) all the countries have confirmed their obligations again on development of national and sub regional strategies of SD.
Foundation laying principle of the Conception SD ASB is the adoption of the system of regional OBJECTIVES of SD and major directions of their realisation (including co-ordination mechanism, SD, financing and participation in civil sector) on the basis of which with consideration of economic and social and ecological conditions of the CA countries will be formed the SD Strategy of ASB (Agenda 21 ASB)
Conception of SD ASB is based on priority directions of ASB-2 Program, ratified by the Heads of the states as well as on the materials of sub regional and national reports of CA countries on completion of Agenda 21, strategic program and survey documents, statistical data on environment, SD of the countries of the region and IOs.
After approval of the Program ASB-2 it is suggested to commensurate the development of Strategy /Program SD ASB (Agenda 21 ASB AS program document) With more detailed elaboration and coordination of developmental OBJECTIVES are important for their achievement activities for rather longer period.

OBJECTIVES
Elaboration of unified long-term conceptual basis of preparation of regional programs of the basin of the Aral sea, support to elaboration of CA Agenda 21 for SD at local brunch and national and regional levels.

COMPOSITION OF WORKS:

• Component A formation of methodology and generalization of world experiences on development and realization of development strategies

• Component B description in a detailed way of major developments OBJECTIVES of CAR with the consideration of volume of ecosystem and other requirements of sustainability

• Component Identification of priority directions of SD in branches, sectors and basic groups of the population, economic, cultural, and institutional mechanisms of implementation of SD measures

• Component D Conduction of public discussions and adoption of the conception at higher political; level

• Component E inclusion into legal documents and educational programs comprehensive apparatus of SD formation of brunch object areas for specialists attestation on SD;

ANTICIPATED OUTCOMES

- Consolidation of budget sources of all the levels
- Organization reinvestment funds using the pattern of rapidly growing biggest funds in Poland and Slovakia.
- Ecological restructurization of inner and exterior debts with formation of ecologic investment financing including international funds
- Ecologic and natural rent;
- Charity donations from business activities together, with taxation exempts
- Consolidation of budget sources of all levels
- Organization of reinvestment funds along with rapidly growing biggest funds in Poland and Slovakia
- Ecological restructurization of inner and exterior debts with formation of ecologic investment non government organization
- Additional sources of financing including international funds
- Ecological and natural rent
- Charity donations from the business and taxation exempting
- Foreign and inner subsidies

TENTATIVE COSTS

Total 150 000 USD

DURATION:

Anticipated activities start 2003

Anticipated activities completing 2006

PRIORITY 12
The regional programme of actions on combating with desertification

PROJECT NAME: 12.1
Combating with desertification, Development of alternative methods of management

JUSTIFICATION:
Degradation of lands due to erosion, pollution, deforestation, salinization and others has been caused by nature-climatic factors as well as by anthropogenous activity.
During the last years the pasturable loading per unit of area is increased; fertility of arable lands is decreased due to the carry-over of nourishing components by irrigated and rain waters and erosion, and salinization; the irrigated area and crop fertility are decreased; pollution of water and land is decreased; rare kinds of flora and fauna are disappeared.
Significant part of land resources is exposed to the process of desertification: degradation of plant cover, sand deflation, water and wind erosion, salinization of irrigated soils, man-caused desertification, pollution of soils by industrial and domestic wastes, pesticides and others. The combination of these factors causes the changes of soil function, by other words the quantitative and qualitative deterioration of their properties and decreasing natural and economical significance.
The processes of land degradation are widely distributed in Central Asia. Analysis of data shows the following basic problems connected with the land degradation:

- Secondary salinization and over-moistening of lands at the conditions of irrigated agriculture;
- Irrigation erosion of lands in mountain and foothill areas;
- Degressive pastures in regions of intensive distant-pasture cattle breeding;
- Deflationary and man-caused desertification during agricultural and industrial land-reclamation;
- Pollution and loss of land fertility at using agricultural chemicals, effluent of industrial and domestic wastes;
- Salinization of lands caused by shrinkage of the Aral Sea

As a consequence the factor of desertification leads to economic decay in countryside, that decreases the profits and living standard of population, increase of morbidity, various pathologies and death-rate.

OBJECTIVES:

Development of comprehensive measures on combating with desertification and degradation of lands in Central Asia. The project is directed on an introduction of alternative types of the economic activity with purpose to decrease the economic pressure on land and plant resources as well as to increase life-support of population.

COMPOSITION OF WORKS

Regional components

- System of regional monitoring of desertification;
- Regional office on combating with desertification;
- System of experience exchange on combating with desertification;
- Development of recommendations on improvement and unification of the national legislations;
- Monitoring and support of implementation.

National components

- Stations on desertification monitoring (by 1-2 per country);
- National office on combating with desertification;
- 3 pilot small-scale projects on afforestation of Aral sea bottom implemented by rural communities (Kazakhstan, Turkmenistan, Uzbekistan);
- 2 pilot small-scale projects on restoration of mountain forests implemented by rural communities (Kyrgyztan, Tajikistan);
- 5 pilot small-scale projects on irrigation, eco-tourism, development of domestic industry and other kinds of alternative management.

ANTICIPATED OUTCOMES:

- Reduction of a poverty level;
- Assessment of desertification level and their effect on environment, introduction of remote monitoring methods;
- Support of sustainable coordination mechanism on combating with desertification process;
- Development of alternative methods of management, including eco-tourism to decrease a loading on the land and plant resources and to decrease a level of poverty as factor of desertification, organisation of regional marketing of agricultural products;
- Rehabilitation of eroded lands, implementation of agro-technical,

organisation and management, forest-land-reclamation and hydro-technical measurements;
- Rehabilitation of strongly degraded pastures, introduction of methods of the rational pasture use.

TENTATIVE COSTS:
Total: 1 800 000 USD

DURATION:
Estimated date of work start 2003
Estimated date of work end 2010

PRIORITY 12
The regional programme of actions on combating with desertification

PPRJECT TITLE: 12.2
The prevention and restoration of degraded land in the Aral Sea basin

BACKGROUND:
Degradation of lands in a result of erosion, deforestation, salinization and others is caused by both natural-climatic and anthropogenic activity.
During the last years: the pasturable loading per unit of area is increased; fertility of plough-land is decreased due to carry-over of nutrient elements by the irrigated and rain waters, erosion and salinization; the irrigated area and croup capacity are decreased, the land and water pollution is grown; and some rare kinds of flora and fauna are disappeared.
The significant part of land resources is undergone to desertification: degradation of plant covering, sand deflation, water and wind erosion, salinization of the irrigated area by industrial and domestic wastes, pesticides and others. The combination of these factors leads to change of soil functions, i.e. to quantitative and qualitative deterioration of their properties and decrease of natural-economy significance.
The degradation processes are widely distributed in the CA countries. Analysis of data shows the following basic problems of land degradation:

- Secondary salinization and over-wetting at conditions of the irrigated farming;
- Irrigated erosion of soils in mountain and foothill regions;
- Pasturable digression in regions with intensive distant pasture;
- Deflation and man-caused desertification under agricultural and industrial land-reclamation;
- Pollution and loss of fertility at using agro-pesticides, industrial and and domestic wastes discharge;
- Land salinization caused by shrinkage of the Aral Sea.

OBJECTIVES
It is necessary to carry out the land inventory and to determine the character of their degradation. To use the perspective of region development and urbanisation of the nearest landscapes and to determine a tendency of their degradation.

WORK STRUCTURE
To use the perspective of region development and urbanisation of the nearest landscapes and to determine a tendency of their degradation.

EXPECTED RESULTS
The criteria of assessment, order and components for monitoring of degraded lands will be established.
The division into districts by a degree of vulnerability is being made, the legislative aspects is being defined. It is being created five demonstration projects.

PRELIMINARY COST
Total: 3 500 000 $

DURATION
Estimated date of work start 2003
Estimated date of work end 2006

PRIORITY TITLE
Development of wetlands in downstream reaches of Amudarya and Syrdarya.

PROJECT NAME: 13.1
Development of wetlands in the delta of Syrdarya river

JUSTIFICATION:
Because of the step out of the sea the existing bed of Syrdarya river eroded and deepened, the regular floods of the system delta are not more taking place, taking into consideration that its square area 750 thousand ha. In the natural conditions the floods maintained the productivity at the same level of the places: water surfaces of lakes - 69 thousand ha, wetlands- 59 thousand ha, meadow hays - 81 thousand ha. Because of the step out of the sea the eco-system Aral-delta stopped its existing, the lakes dried out, fishing is no longer taking place, there are no meadows, the process of delta deserting has begun.
Through construction of land facilities, and at the present moment construction of the dam "Aklak" it is planned to rehabilitate flooding of the part of the lake system. In future it is planned to construct the second dam "Raim"for certain flooding of the other lake systems. However in the conditions of scarce water resources and absence of the back-up system from the sea side the regulation of the level regime of flooding is not guaranteed. The system of regulating dams and re-discharge constructions is needed.
To create such a system the development of the water regime regulation Scheme is foreseen.
In the water regime regulation Scheme it is implied to develop and implement projects of urgent works in delta on the construction of dams and regulating facilities and study the expedience of rehabilitation of the second turn of Northern Aral Sea (NAS).

OBJECTIVES:
- Creation of conditions for delta lake system water regime regulation.
- Implementation of steps on the partial rehabilitation of bio-productivity of delta and improvement of social and economic conditions of the living in the delta. - Creation near the town Aralsk of water facility with the stable horizon of water both on high water and low water periods. -

Provision of the free shipping on the whole water area of the "Northern Sea" during the whole iceless period. - Improvement of the ecological situation in the town of Aralsk and along the seaside of the Northern Sea.

- Creation of new working places and decreasing of unemployment in the town of Aralsk

COMPOSITION OF WORKS:

Collection of topographical, hydrological materials of the past period, taking of geo-botanical pictures, determination of the requirements of delta to the water regime flooding with determination of optimal water levels in the lake systems, requirements of water and dates of flooding. Development of the dam location scheme, regulating constructions and "Raim" dam. Feasibility evaluation.

Development of the project of urgent works in delta.

Pre-project works of the second turn of NAS rehabilitation

ANTICIPATED OUTCOMES:

Water regime regulation scheme of the Syrdarya river delta.

Implementation of the urgent works in delta under the designed dam "Raim" that maintained implementation regulation of the floods of 6 thousand ha hays, 35 thousand ha озер и 5.0 thousand ha - wetlands.

TENTATIVE COSTS:

DIW costs Scheme development	350 000 USD
Design development	600 000 USD
Development of the pre-project works	200 000 USD
Implementation of the urgent works in delta	22 000 000 USD
Total	23 150 000 USD

DURATION:

2004 - 2009

PRIORITY TITLE
Development of wetlands in downstream reaches of Amudarya and Syrdarya.

PROJECT NAME: 13.2
Development of wetlands in the delta of Amudarya river.

JUSTIFICATION:
With the beginning of drying out of Aral Sea the importance of organization of buffer zones becomes more and more important in the struggle against salt and dust transfer, deserting prevention and biological productivity rehabilitation of the Amudarya delta. In the beginning of 1990s to improve the ecological situation in the lands next to Aral sea the works have been launched on creating little local water facilities next to the villages of Muynakskiy rayon, but then, in general because of the economic reasons they were stopped. The project aimed at preserving wetlands in the downstream reaches of the rivers, what can be reached through creating the network of little water facilities and managed lake systems and creating local experiment and production territories on preserving and development wetlands and their biological diversity.

OBJECTIVES:
The foresees through the rational usage of flood and sanitary flows of Amudarya river and CDW of the northern part of the irrigated lands of Karakalpakstan, step-by-step implementation of the complex of urgent steps on the engineer regulation of water regime and volume augmentation of Mezhdurechenskiy resevoir, rehabilitation and reconstruction of water economy structure of lake system of Muinak rayon with further rehabilitation of the whole delta of Amudarya river. Such a strategy of step-by-step construction takes into consideration existing financial constraints and water resources' deficit.

COMPOSITION OF WORKS:
- development of feasibility study and working documentation of the project,
- construction of facilities,
- social and economic monitoring.

ANTICIPATED OUTCOMES:
Rehabilitation of water facilities structure of Muinak rayon within the framework of the present project will maintain fishing growth by 1200 tons, 2360 roubles in the prices of 1991. Besides the guaranteed growth of the agricultural production will be maintained, cattle breeding, favorable conditions will be created for propagation and rest of the wetland birds, development of the forest plant eco-systems. The total annual benefit of the project implementation in the form of additional production of the economic activity of the local population will equal to 4,6 mln. roubles annually in the prices of 1991.

TENTATIVE COSTS:
8 570 000 USD

DURATION:
2003 - 2007 гг.

PRIORITY TITLE
Rational usage of saline drainage water.

PROJECT NAME: 14.1
Management of transboundary return flows in the Aral Sea Basin. Regulation and usage of the saline and drainage waters. Activities on the improvement of quality if the saline and drainage waters with the aim to reuse them to cover the deficit of water resources

JUSTIFICATION:
There are 35-36 km^3 saline drainage water in Central Asia annually pored mainly into the river stems and depressions - lakes, wetlands. As a result in the middle - and down stream of the most rivers the quality of water has abruptly deteriorated, what initiated salinity of the irrigated lands and real menace to the health of the population. In the depressions - lakes salinity and pollution of water increase, water and near the shore ecosystems are being polluted, near the shore territories are being flooded and process of salt containing is increasing. The main volumes of saline and drainage water are transboundary: formation of return water flows takes place in one states, and transit, poring and pollution in other ones.
In the conditions of the increasing deficit of water resources saline drainage waters can become supplementary sources of water resources. But their quantity is not constant, and their quality can create new problems for their reusing.
The growth of impact of drainage waters on the agrolandscape will lead to the reduction of agricultural productivity. Therefore for harmless reusage of drainage waters for irrigation the comprehensive evaluation of the quality, the quantity regime of formation, forecast on the various ways of development is needed.

OBJECTIVES:
Creation of the management system of the transboundary return water flows that provides the quality of water in rivers; perseverance of the bio-diversity in the depressions (water ponds and lakes) and usage of transboundary return water flows, secondary water resources, and also development and implementation of scientifically justified activities on the development of hydro ecosystems and agrolandscapes on the basis of the reusage of saline drainage waters.

COMPOSITION OF WORKS:

- Comprehensive evaluation of present volumes, conditions and formation regime, and quality of inner state and transboundary drainage waters, and also trends of development of hydro - and agrolandscapes on the basis of reusage of drainage waters;
- Development of the principles, strategy and social and economic aspects of transboundary return water flows management to improve the quality of water in rivers and criteria of sustainable development of hydro ecosystems and agrolandscapes on the basis of reusage of drainage waters;
- Implementation of pilot projects on reusage of drainage waters and cultivating of galophit plants in the zone of poor mineralized (Fergana valley), mineralized (Hunger Step) and heavy mineralized (Southern Reaches of Aral Sea) of drainage waters;
- Development of scientifically justified activities on the improvement of drainage waters and sustainable development of hydro ecosystems and agrolandscapes on the basis of the reusage of drainage waters;
- Organization and conducting of training of water specialists and farmers on the leading of economic activity on the basis of drainage waters;
- Implementation of pilot projects on transboundary return water flows.

ANTICIPATED OUTCOMES:

Making available the required quality of water in river through transboundary return water flows management.

Sustainable development of lake and water pond ecosystems.

Organization transboundary return water flows management on the national and interstate level.

Scientifically justified activities on the integrated drainage water flow management for sustainable development of hydro ecosystems and agrolandscapes on the basis of the reusage of drainage waters

TENTATIVE COSTS:

3 000 000 USD

DURATION:

2003 - 2009

PRIORITY TITLE
Rational usage of saline drainage water.

PROJECT NAME: 14.2
Completion of the construction of the Turkmen lake of the "Golden century".

JUSTIFICATION:
The main problems that Turkmenistan faced in the sphere of water problems:

- releases of the drainage waters in Amudarya river and, as a result, deterioration of the quality of irrigating water in the downstream of Amudarya river, the waters of which irrigate the lands of not only Dashoguz velayat of Turlmenistan, admitted to be the zone of calamity, but also the neighboring lands of Uzbekistan;
- negative impact on the state of the irrigated lands of Dashoguz velayat because of the over-the-norms volumes of collector and drainage water releases from the territory of Uzbekistan through the international collectors • Ozerny, Dar'yalykskiy, Chagat-Atabentskiy;
- considering that the water volumes, going through the international collectors, exceed the planned ones, the lake Carykamysh gets the square mirror of its surface augmented that widespreads beyond the borders of Turkmenistan on the territory of neighboring country;
- because of the absence of water receivers for collectors, bringing out CDW from the irrigated lands of Lebapskiy, Maryiskiy, Akhalskiy and Balkanskiy velayats of Turkmenistan, temporarily it was decided to release these waters in the sands of Karakums, where the flooding of lands and pastures took place.

Implementation of the creation project of Turkmen lake of the "Golden century" will enable more rational to use the inner discharge of CDW in the interests of Turkmenistan, improve the ecological state of the river and Karakum desert, soil improving state and land irrigation.
The total length of the collcetors' system of the Turkmen lake of the "Golden century" makes more than 2650 km, the square area of collectors influence-2240 thousand ha. The total area of irrigated lands of Turkmenistan, the soil of which is supposed to be improved, is more than 2 mln. ha. The construction of the Turkmen lake of the "Golden century" has been implemented since 2000 at the expense of the assets of Turkmenistan. At the present moment the part of inserts and headwork constrictions has already been completed. The release of water to the zone of the Turkmen

lake according to the pioneer open tract is planned to be realized in 2-3 years.

OBJECTIVES:

Improvement of the ecological situation on the territory of Turkmenistan and in the downstream of Amudarya river through exclusion of releases CDW in rivers Amudarya, Murgap, Tedjen and Central Karakums, increase of productivity of the used irrigated lands.

COMPOSITION OF WORKS:

Construction of the main collector of the "Golden century", through which the used water from the irrigated lands of Lebapskiy, Maryiskiy, Akhalskiy velayats will be brought out into the Turkmen lake of the "Golden century" with the volume 132 km^3. The main collector is beginning from the left shore collector and goes from the East of Amudarya river till the Turkmen lake of the "Golden century". On the length of 126 km it goes through the territory of Lebapskiy velayat, collecting the drainage waters from right - and left bank lands. Water expense along the collector on the border of Lebapskiy velayat can reach 125 m^3/sec. The length of the collector within the Maryiskiy velayat makes 160 km and its expense on the border of the velayat- 180 m^3/sec, with consideration of expenses of going into it collectors of Murgab oasis (Djarskiy release, The main Murgabskiy collector). The length of the main collector of the "Golden century" within Akhalskiy velayat makes 363 km and in the outcomes from the velayat its expense is about 245 m^3/sec, including costs, collectors (Tedjenskiy central collector, The main gyaurskiy collector, Achkhabadskiy uniting collector and Geoktepinskiy water releasing collector).

Further the collector of the "Golden century" goes through the territory of Balkanskiy veleyat and goes into Karakum lake of the Golden lake.

The activities on the bringing out the CDW from the territory of Dashoguz velayat include the complex of works on the reconstruction of the length of the existing Il'yalinskiy flooding channel on the length of 145 km with the further augmenting of releasing capacity till 210 m^3/sec and construction of the joining channel with 65 km long between Dar'yalykskiy and Ozerny collectors on the spending of 90 m3/sec, re-construction of the channel Zebgibaba-Uzboi with length of 45 km for the release of perspective spending and maintaining water supply through the bed of Uzboi on the length of 160 km.

The total length of the main collector of the "Golden century"- 720 km with the calculated spending of 455 m^3/sec.

ANTICIPATED OUTCOMES:
Improvement of the ecological situation in Turkmenistan, increasing of productivity of the used irrigated lands, agricultural production costs sinking.

TENTATIVE COSTS:
2 000 000 000 USD

DURATION:
2000 - 2010