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ОТЧЕТ И ПЛАН ДЕЙСТВИЙ  
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НАРАЩИВАНИЕ НАЦИОНАЛЬНОГО  
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REPORT AND ACTION PLAN ON  
NATIONAL CAPACITY TO IMPLEMENT  
COMMITMENTS OF THE REPUBLIC OF  
TADJIKISTAN ON GLOBAL ENVIRONMENTAL



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**REPORT AND ACTION PLAN ON BUILDING NATIONAL  
CAPACITY TO IMPLEMENT COMMITMENTS OF THE  
REPUBLIC OF TAJIKISTAN ON GLOBAL  
ENVIRONMENTAL CONVENTIONS**

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Report and Action Plan on Building National Capacity to Implement Commitments  
of the Republic of Tajikistan on Global Environmental Conventions  
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with Illustrations and References

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The Report and Action Plan on Capacity Building defines the key trends and priorities of Tajikistan in the implementation of its commitments on Global Environmental Management, especially in the areas of biodiversity, climate change and combating desertification. This document provides a review of the capacity self-assessment process, assessment methodology, and the results of the analysis aimed at the identification of stakeholders and support at the highest level. The process of self-assessment (PSA) covered the issues related to the capacity within each of these thematic areas (biodiversity, climate change and combating desertification) and identified those inherent in all Conventions. In addition, it defined ways to overcome barriers in the capacity-building process as well as activities aimed at joint efforts in the implementation of the three environmental Conventions.

Following are the entities that contributed to drafting the Report and Action Plan on National Capacity Building to Implement Commitments of the Republic of Tajikistan on Global Environmental Conventions:

- Government of the Republic of Tajikistan
- Ministry of Industry of the RT
- State Committee on Environmental Protection and Forestry
- State Land Management Committee
- State Hydro-Meteorological Survey under the State Committee on Environmental Protection and Forestry
- Center of Strategic Studies under President of the RT
- Academy of Sciences of the RT
- National United Nations Development Program

Public Associations and NGOs:

- International Institute of Human Ecology
- "Kuhiston" Foundation
- "Hamtavan"
- "Man and Nature"  
Environmental Union

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## PR

Natural ecosystems are a reliable and the single source of environmental stability in the world. At the same time, the impact of anthropogenic activity on ecosystems is becoming the main reason for climate change, loss of biodiversity and desertification/land degradation. Control of environmental risks requires a strong environmental policy, improved coordination of government structures, civil society and business representatives involved in the implementation of global environmental Conventions.

UNDP/GEF "Self Assessment of National Capacity Aimed at Global Environmental Management in Tajikistan" Project demonstrated a similarity of goals, objectives, key principles and commitments of the three global environmental Conventions. This factor makes it possible to join efforts towards the implementation of these Conventions. Joint efforts in capacity building in all three areas help avoid overlapping implemented activities, reduce unreasonably high costs and provide a systematic environmental policy aimed at the conservation and rational use of natural resources at all levels.

The project's outcome is reflected in the Report and Action Plan on National Capacity Building to implement Commitments of the Republic of Tajikistan on Global Environmental Conventions.

The present document consists of 14 sections providing an overview of the capacity self-assessment process, assessment methodology and the results of the analysis aimed at identifying stakeholders and support at the highest level. Thematic assessment covers common barriers and constraints under the three Conventions. The cross analysis helped identify priorities within the three Conventions and the need to build capacity in priority areas. The Action Plan defines ways to overcome barriers in the capacity-building process, as well as activities aimed at joining the implementation

## AC

efforts. The matrix of measures to be taken for national capacity building is based on prioritizing those efforts having the most significant impact on the implementation of the Conventions on climate change mitigation, biodiversity conservation and combating desertification in the Republic of Tajikistan.

Preparation of the Report and Action Plan on National Capacity Building to Implement Commitments of the Republic of Tajikistan on Global Environmental Conventions involved highly qualified experts representing relevant ministries, institutions and NGOs with sufficient experience in drafting National Action Plans, in cooperation with academic circles and international organizations. The document defines trends and priorities of state policy in the implementation of national policy on environmental protection under the framework of the three Conventions.

The key items of the Report and Action Plan on national capacity building were discussed at a number of national workshops and working sessions, with the involvement of relevant ministries and institutions, NGOs, mass media and international experts. All comments and feedback were thoroughly analyzed and taken into account during the preparation of the Report and Action Plan.

Consultative, technical and financial assistance in the preparation of the Report and Action Plan on national capacity building was provided by the Government of the Republic of Tajikistan, the Global Environmental Facility and the United Nations Development Program.

The authors of the Report and Action Plan on national capacity building express their sincere gratitude to team and group leaders, experts, specialists, editors, reviewers and consultants both national and international who devoted their time and efforts to the preparation of this document

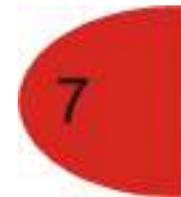
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## Executive summary



Resolving global environmental problems under the three Conventions (biodiversity conservation, climate change and combating desertification) will provide sustainable socio-economic development of society. One of the main tasks of the International Declaration on Millennium Development Goals (MDG) is to provide sustainable development of the society, eradicate poverty and protect the environment.

National Action Plans (NPA) on the three Conventions developed and endorsed by the Government, establishment of centers, and enacting legislation prove the existence of the legislative and institutional basis for the implementation of these Conventions.

However, the capacity-building process is impeded at the systemic, institutional and individual levels. The main constraints at these levels are of an economic, financial, legislative, technical, informational, and personnel character.

The entity responsible for environmental management in the Republic as well as for the coordination of activities on Global Environmental Management, and international environmental Conventions among governmental organizations, academic circles, universities, NGOs and other stakeholders is the State Committee on Environmental Protection and Forestry.

The Government of Tajikistan established a number of working groups on the control and coordination of the implementation of International Environmental Conventions. The working groups include representatives of relevant ministries and institutions, as well as scientific research institutes working in the area of environmental protection. In general, these working groups are responsible for the identification of the main state policy trends in the context of international agreements on environment. In addition, their duties include evaluation of draft thematic documents such as action plans, strategies, programs, statements and others, as well as draft financial proposals. At

the same time, the working groups develop activities related to sector programs and policies, and contribute to the dialogue between stakeholders and the general public.

Implementation of the three Conventions (on climate change, biodiversity conservation and combating desertification) and other international programs in Tajikistan provided experience in conducting assessments, drafting reports, training various kind of specialists, development of educational programs for the population, raising awareness and information exchange at the national level.

Outcomes of these, as well as of previous activities, and the existing coordination mechanisms were used during the "Self-Assessment of the National Capacity for Global Environmental Management."

The goal of the present document is to identify priority needs in building Tajikistan's capacity to implement its commitments under Global Environmental Management, especially in the areas of biodiversity, climate change and combating desertification.

The document uses the overview of capacity self-assessment, assessment methodology and the results of the analysis aimed at identifying stakeholders and support at the highest level.

The PSA process helped assess the issues related to the capacity of each thematic area and define priorities common to all Conventions.

The Action Plan is based on the identified priorities in capacity building: it defines activities required to overcome the main barriers, responsibility for their implementation, financial commitments and funding sources. The Action Plan is aimed at integrating and complementing existing government and donor projects and plans. The NAP envisages developing individual projects that will attract the financial and technical assistance of potential donors. Monitoring and evaluation strategy will become essential parts of the NAP, to ensure priority implementation.



# General information on the Republic of Tajikistan

## 1. NATURAL ENVIRONMENT

Tajikistan is situated in Central Asia at 36°40'-41°05' northern latitude and 67°31'-75° 14' eastern longitude. The territory of the Republic covers 143.1 thousand km<sup>2</sup>.

Tajikistan is a mountainous country. Around 93% of its territory is covered with mountains; over half the territory is located at 3,000 m. above sea level. The highest point of the Republic is I. Somoni Peak, at 7,495 m. above sea level.

The climate of Tajikistan comprises the widest temperature range, moisture conditions, precipitation character and intensity of solar radiation. Depending on the elevation, an average annual temperature may vary from +17°C in the south to -6°C and below in the Pamirs (figure 1.1). In the hot, lowland deserts of southern Tajikistan and cold high-mountain deserts of the eastern Pamirs, an average annual amount of precipitation varies from 70 to 160 mm., while maximum precipitation is more characteristic of Central Tajikistan and may exceed 1,800 mm.

The rivers of Tajikistan are key tributaries

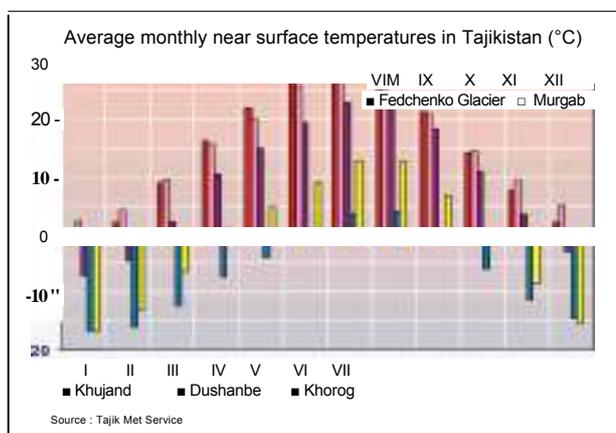


Figure 1.1

of the Aral Sea; they carry their waters to the downstream countries and form the basis of cotton growing and hydropower. Tajikistan is rich with lakes. There are over 1,300 lakes here; over 80% of all lakes are situated at above 3,000 m. and each have a surface area of less than 1 km<sup>2</sup>. The total surface area of the country's biggest lakes is over

680 km<sup>2</sup>. The biggest lake in Tajikistan is Karakul (3,914 m. above sea level) located in the eastern Pamirs; the lake's surface area is 380 km<sup>2</sup> and the water is salty. The deepest lake in Tajikistan is Lake Sarez (3,239 m. above sea level); its maximum depth exceeds 490 m., the surface is 86.5 km<sup>2</sup>; the water is fresh.

The forests of Tajikistan occupy a territory of 410,000 ha. Primarily, this is an open juniper forest prevailing at 1,500-3,200 m. above sea level. Pistachio trees, well accustomed to the hot dry climate, are mostly found in southern Tajikistan at an elevation of 600-1,400 m. Walnut forests are characteristic of Central Tajikistan at the elevation of 1,000-1,200 m. above sea level and are known by their specific requirements for soil and climatic conditions. Part of the forest belt consists of maple forests with fragmentary poplars, willows, birch trees, buckthorn, saxaul and various shrubs.

Tajik fauna is characterized by great genetic diversity. Mountain fauna is richer than that of the plain and contains a substantial number of European-Siberian and East-Asian elements. The fauna of the hot, lowland deserts contains plenty of Indo-Himalaya, Ethiopian and Mediterranean species. Genetic relation of flora and fauna with other faunal and floral areas (Mediterranean, Central-Asian, desert complexes of Turan and Arctic-Alpine elements) enrich the biodiversity genetic pool of the Republic.

Soil-building processes in Tajikistan served as the basis for the development of the modern soil classification with the following bioclimatic soils: (1) gray soil, (2) mountainous brown, (3) high-mountain meadow-steppe, (4) high-mountain steppe, (5) high-mountain desert-steppe, (6) high-mountain deserts, (7) nival belt. Implementation of measures for the rational use of the soil landscape is considered one of the most important tasks. To resolve this problem, the country is developing zonal agricultural systems, with micro-zoning based on the natural and economic conditions relating to the mixed use of soils.



## 2. SOCIO-ECONOMIC CONDITIONS

### 2.1 Population

Changes in the Tajik economy occurring during the past decade had a serious impact on reproduction, population structure, distribution and employment.

By January 1, 2003, the total population consisted of 6.3 million people.



Picture 1.1

Administrative-territorial division of Tajikistan includes three provinces: Sogd Province with a population of 1.9 million people (territory 25,400m<sup>2</sup>); Khatlon Province 2.2 million people (territory 24,800 m<sup>2</sup>); GBAO 0.2 million people (territory 64,200 m<sup>2</sup>); Regions of Republican Subordination with a population of 1.4 million people (territory 28,600 m<sup>2</sup>); and the city of Dushanbe (capital city) with a population of 0.6 million people.



Picture 1.2

According to data, the country is characterized by irregular population distribution. The highest population density is characteristic of valleys and foothills, the lowest of mountain river valleys, mid-mountains and high-mountains. Small and medium-size compact settlements of foothills, mountain slopes and gorges form irregular population centers divided by mountain ridges and unpopulated areas (picture 1.1).



Urban population is only 26.5%, while rural population constitutes 73.5%. The size and characteristics of settlements are influenced by the country's natural conditions. Valley oases mostly contain large settlements of 200-700 households. Mountain villages are relatively small and consist of 15-20 households (picture 1.2).

The most populated city in Tajikistan is the nation's capital city of Dushanbe. The second largest is the city of Khudjand (picture 1.3) the center of Sogd Province. Other big cities of Tajikistan are Kuliab and Kurgan-Tube.

The state's national language is Tajik. Russian has status as the language of international communication and cooperation for all citizens of the Republic.

### 2.2 Main Trends of Economic Development

Picture 1.3



One of the most important branches of the economy is the power industry. From 1990 to 2003, annual electric power production equaled 15 billion kWh.

Of eighty (80) branches of the Tajik economy, the most prevalent is the non-ferrous metallurgy industry, with a share of around 50%. Enterprises of non-ferrous metallurgy produce aluminum, gold, silver, lead, zinc, molybdenum, tungsten, mercury, antimony, etc.

Agriculture forms the base for the development of light and food industry, especially the production of cotton fiber, canned goods, meat products and others. In 2003, agricultural production involved 169 kolkhozes, 148 sovkhoses, and 16,300 dekhkan farms.

Today there are 3,350 secondary schools

in Tajikistan with 1.5 million pupils. Thirty (30) universities and 72 technical colleges train over 100,000 students. The staff of the Academy of Sciences and scientific-research institutes exceeds 5,000 researchers.

The number of physicians reached 13,000; there are 19.1 doctors and 43.1 nurses per 10,000 people. Over 1,000 medical facilities, including 452 hospitals, provide services to both urban and rural populations.

The break-up of trade and economic relations with other republics of the former Soviet Union and the loss of central budget allocations had a significant negative impact on the Tajik economy. The civil war that inflicted total damage of 7 billion USD and natural disasters impaired the country's infrastructure and productive capacity. This resulted in a 50% drop of the GDP in 1992-1995, fluctuations of the budget deficit and the deficit of the current balance of payment in the range of 20-30% of the GDP, to say nothing of financial imbalances. Both external and internal debts jumped up. The level of inflation during this period reached a four-digit number.

However, after signing the Peace and National Reconciliation Agreement in June 1997, the country achieved relevant success in macroeconomic stabilization. Budget deficit and inflation levels went down; prices were liberalized for practically all goods and services, especially those of social significance such as bread, flour and grain. Foreign trade has also been liberalized; export tariffs were cancelled for most goods; export monopoly of the government was eliminated with regard to cotton and aluminum; land use and farm reorganization reforms have expanded in the agricultural sector.

These reforms helped overcome the economic depression and steadily maintained the Gross Domestic Product (GDP) growth during the past 7 years. Compared to 1991, in 2003 the real volume of the GDP increased by only 51.9%.

Considering the lack of internal resources and the complicated financial situation, it is most important to attract foreign investments, with priority given to direct investments. By early 2004, the volume of foreign investments in the Tajik economy constituted \$361.1 million. With regard to our economic needs, this is not much and we hope to increase entrepreneurial investment activity. At present, the Government of the Republic of Tajikistan has developed a three-year State Investment Program (SIP). International cooperation has expanded, as has participation in international and regional programs.

The main task of the Tajik Government is poverty reduction. Whatever the poverty line is, poverty is still widespread and the poverty level is still high: according to international organizations, 64% of the population lives below the poverty line. One third of the population is estimated as "very poor" these are primarily people of advanced age. At present, there is no clear relationship between poverty and employment, which is reflected in the low level of wages. To fight poverty, it is important to improve the labor market because it is the single source of prosperity available to all.

The fact that the success of socio-economic reforms to a large extent depends on the environmental policy has been reflected in the country's Constitution. Article 13 says: "Land, its subsurface resources, water, air, flora and fauna and other natural resources are an exclusive state property, and the state ensures their effective use in the interests of people."



## PART 1 PSA PROCESS REVIEW



### Introduction

Active participation of all countries in the global environmental process began with the UN Conference on Environment and Development, which took place in Rio de Janeiro in 1992. A number of multilateral environmental agreements provided another powerful incentive.

Taking into account the importance of environmental problems, Tajikistan joined the following Conventions:

- United Nations Framework Convention on Climate Change (1998);
- Vienna Convention on the Protection of Ozone Layer (1998);
- Montreal Protocol on Ozone Depleting Substances (1998);
- London and Copenhagen Amendments to Montreal Protocol on Ozone Depleting Substances (1998);
- UN Convention on Biodiversity Conservation (1997);
- UN Convention on Combating Desertification (1997);
- Convention on the Protection of Migrating Wild Animals (2000);
- Ramsar Convention on Wetlands and Convention SITEC (2000);
- Aarhus Convention (2002).

Ratification of international conventions by Tajikistan demonstrates that the country wants to become a full member of the world community by acting in compliance with international law in the area of sustainable development and consecutively amending its legislation according to international standards.

Quite a number of problems may be triggered by the complex impact of climate change, loss of biodiversity, drought and desertification on the social, economic, and environmental conditions in many countries. We are also aware of the commonalities found in the three environmental Conventions and of the need to amend the

strategic approaches previously used by interested parties.

Understanding the mutually related impacts of these Conventions and searching for synchronization, coordination and common activity are the most effective means of protecting the global environment on a national scale.

Capacity building may be implemented at the local, national and global levels, at the level of individuals and stakeholder groups, physical and legal entities, and institutions. Capacity building implies not only the creation of new actions, but also the use of previously existing capacity.

*The "capacity building" concept is used in various contexts and very often without the due attention to its meaning. During the past few years experts from many countries tried to develop a common meaning of this term and at present "capacity building" means "activities aimed at building the capacity of citizens, institutions and systems to adopt and implement their functions in the most efficient, effective and sustainable manner".*

The main tasks to be included in the capacity-building needs assessment of the three priority areas are as follows:

- identification, confirmation or reconsideration of priority actions under the framework of the three Conventions on climate change, biodiversity conservation and combating desertification;
- "capacity building" common needs assessment in the three thematic areas;
- stimulating coordinated and targeted activities, and submission of applications for future external funding and assistance;
- adopting measures following the National Strategy on the protection and rational use of the environment and sustainable development.

The analysis of the guiding principles of the three Conventions shows that they are very much alike and that the tasks envisaged by these Conventions are closely related. It means that the needs assessment strategy



must be concentrated on joining efforts and synergism in the implementation process.

It is worth noting that creating a perfect synergetic system capable of self-realization is a difficult task. If such an effort is undertaken, the utmost attention should be paid to the following actions:

- create opportunities for coordination and synchronization of joint actions in resolving tasks common to the three Conventions;
- avoid overlap in the use of resources and efforts in resolving similar problems;
- create a favorable atmosphere of cooperation and eliminate conflict between the parties.

Thus, the main objectives of capacity-building efforts shall be aimed at an effective and rational use of national resources, provision of sustainable development of the national economy, and poverty reduction. Resolving global environmental tasks under the framework of the three Conventions shall promote a sustainable socio-economic development of the society in harmony with nature. One of the key objectives of the International Declaration of Millennium Development Goals (MDG) is the provision of a sustainable development of a society and preservation of the environment.

#### Legislative and Legal base

The main normative-legal acts in the area of environmental protection are as follows: the law of the Republic of Tajikistan "On Nature Protection" (1994); the law "On Subsurface Resources" (1996); the law "On the Protection of Atmospheric Air" (1996); and the law "On Hydro-Meteorological Activity" (2002).

The main legislative acts and program documents in the area of land use are: Land Code of the Republic of Tajikistan (1996) and the law of the Republic of Tajikistan "On Land Reform" (1992); the law of the Republic of Tajikistan "On Land Assessment" (2001); the law "On Land Management" (2001); and the "Resolution on the Government Control over Land Use and Land Protection" (1997).

In 1997, the government adopted the National Environmental Program of the Republic of Tajikistan for 1998-2008. In addition, a Program on the Improved Irrigation of Arable Lands for 1998-2003 was

developed. In 2001, the government adopted the National Program of Action of the Republic of Tajikistan on combating desertification.

Legislation in the area of land use stipulates the requirements for effective use of land, application of environmental protection technologies, and measures against the deterioration of the ecology caused by economic activity. Tasks of the land reform include creating conditions for an equal development of various forms of land activity, formation of a mixed economy, and rational use and protection of lands aimed at agricultural growth. Land legislation regulates land management relations between state bodies, local self-governance, authorized government entities in the area of land resource management, as well as physical and legal persons.

The State Land Management Committee of the RT develops a unified policy for the implementation of decisions in the areas of the land management and land relations, exercises governmental control over the effective use and protection of land resources, registers all land-users, and drafts/implements state programs in this area. The structure of the State Land Management Committee includes provincial, district and city committees on land management, the design and survey institutes "Tajikzaminsoz" and "Fazo," which carry out mapping of land-users, registration of various categories of land, soil and geobotanic investigations, and the specification of zones and borders of degraded lands.

*At the system level, "capacity building" is connected with creating favorable activity conditions", that is political, economic, legal, and control mechanisms of activity of various institutions and individuals. It is important to consider relations between different institutions, both formal and informal, as well as their program activity.*

The main legislative acts, program and normative documents in the area of forestry are as follows:

- The Law of the RT "On Nature Protection" (1994);
- Forestry Code of the RT (1993);
- Provision on the protection of forests (1999);
- Provision on implementation on the collateral use in forests (1999);



- The Framework of Forestry Development of the RT through 2005.
- Provision on government control over the conditions, use, reproduction, conservation and protection of forests (2000).

An important role in the development of the private agricultural sector was played by presidential decrees (October 9, 1995, #342 and December 1, 1997, # 874) on the allocation of 75,000 hectares of arable and dry lands for personal use and subsidiary husbandry.

In 2000, the government approved the "Mid-term Program of the Republic of Tajikistan on the Agro-Industrial Sector Turnaround through 2005."

The main legislative acts regulating the power sector are: the law of the Republic of Tajikistan "On Energy" (2000); the law "On Energy Saving" (2002); and the Water Code

(2000). The law of the Republic of Tajikistan "On Safety of Hydropower Constructions" is currently being considered. The law of the Republic of Tajikistan "On Energy" defines the authority of the government, the Ministry of Energy and local administrations in the regulation of energy-related issues. According

*At the institutional level, "capacity building" means an improvement of general organizational efficiency and its functional opportunities as well as the capacity to adapt to changes. The main task here is the development of an institution as an integral system, including its individual staff and groups of personal and its relations with the outer world. Besides the improvement of the material aspects (such as infrastructure), institutional capacity building implies a clear definition of tasks, structures, commitments and duties, procedural and communication changes and the review of labor resource distribution.*

to the acting law, all energy-related activity must be licensed. Foreign investments in the energy sector may enjoy additional tax and other exemptions.

Energy legislation in Tajikistan is closely related to water management issues because the power industry is based on hydropower, which has a complex energy-irrigation purpose. The government endorsed the "Main Provisions on the Regulated Electrical and Thermal Power Consumption in the National Economy"

(1997). To improve the power supply, the government issued a resolution "On the Development of Small Energy" (1997).

Necessary conditions have been created for a consecutive transfer of energy to market relations, attraction of domestic and foreign investment, providing economic independence to power enterprises, and ensuring their development on the basis of market competition.

The government endorsed the "Framework on the Development of Fuel and Power Complex of the Republic of Tajikistan for 2003-2015." The framework reviews the situation in the power sector, defines the circumstances impeding its development and identifies prospective power sector activity trends. However, from an expert opinion, the framework does not fully reflect the reforms and policy improvements in energy sector as well as it does the existing environmental problems.

The Republic of Tajikistan adopted programs on the development of selected branches of the economy, among them "State Program on Refinement and Commercialization of Precious and Semi-Precious Stones in 2001-2005" (2001), and the "Program on the Development of Gold and Silver Industry in 2001-2010" (2002), as well as the recently approved Industrial Development Concept. These programs envisage an increase in outputs, processing and manufacturing of products, development of new fields and implementation of investment projects.

The Ministry of Industry of the Republic of Tajikistan was established in 2002 on the basis of the State

Committee on Industry of the Republic of Tajikistan and is now the lead government body for coordinating industrial policy. The Ministry implements programs to develop the industrial sector, elaborates and carries out technical, environmental and other control

*At the individual level, "capacity building" means the process of changing prevailing views and models of behavior, mainly, through knowledge transfer and the development of skills in an educational process. However, it also includes on-the-job training and active participation in the implementation of measures aimed at the achievement of improved results through a change of management, incentives, attitudes and increased responsibility and accountability*



measures, including standards and requirements for the industrial sector.

In general, the key tasks and objectives of the International Conventions on biodiversity, climate change and combating desertification are very much the same global protection of the environment. The main goal of the NCP is the identification of the priority needs in building the capacity of the Republic to enable it to carry out its

commitments on global environmental management, especially in the areas of climate change, biodiversity and combating desertification. Therefore, all materials, data and work skills gained during the implementation process will be useful for the NCB's work in Tajikistan.

*"Capacity" means both action and a lack of action depending on the desirable result. Often "capacity building" means not the creation of a new "capacity" but redistribution of old or a release of unused capacities.*





## General review of technical approaches

The survey methodology was based on recommendations from GEF and UN DP, as well as on consultations with stakeholders and national and international experts.

Following the endorsement, the project implementation Executive Committee established three thematic working groups (on climate change, biodiversity conservation and combating desertification).

The following technical tasks for thematic groups and experts were developed with the agreement of the working group leaders:

- carry out a thematic review and base situation assessment in respective areas (climate change, biodiversity conservation and combating desertification);
- develop thematic reports on identification and prioritization in the three thematic areas;
- carry out an in-depth analysis and establish linkages with current activities in the country;
- conduct cross-analysis and identify priorities within the three Conventions;
- finalize the NCB report, develop a plan of action and define the implementation schedule.

Criteria for the identification of priorities and the system of their application were developed during workshops, and consultative and working meetings. Based on these criteria, all previously defined priority directions were ranked in order of importance. Results were discussed and confirmed during a national workshop on cross-analysis and by the working groups on cross-analysis.

A decision was made that the maximum number of priorities for a successful implementation was five for each thematic area. Of those five common to all three areas were selected.

Priority identification is aimed at the selection of scientific-technical and practical activities, as well as reforms that could be carried out in various economic spheres to

reduce greenhouse emissions, decrease vulnerability to climate change and promote sustainable development. Priorities are meant to contribute to the improvement of existing technologies and accelerate introduction of new technologies.

Taking into account that the Republic is taking its first steps in the NCB implementation, priority selection is the basis for primary measures to be taken in this sphere.

Priority identification is one of the most complicated and strategically important tasks in the NCB implementation process due to a number of different approaches to values, contradictions and disagreements that should be considered and equalized.

The key factors for priority identification are as follows:

- development advantages;
- contribution to capacity building under the framework of the three Conventions.

Priority identification consists of the following steps:

- elaboration (through a consensus) of a criteria list for the identification of priorities and their distribution according to their significance;
- use of the results of priority distribution to focus on multi-level issues;
- applying criteria to already defined issues and capacity gaps;
- confirming the choice of priorities through a multi-party discussion (at a national workshop and consultative meetings with all stakeholders).

Identification of priority directions should take into account that, with regard to the three Conventions, they are aimed at promoting environmental protection and sustainable development, including:

- effective economic growth;
- increased production facilities;
- use of local resources and integration of new technologies;



- improved population health;
- property risk reduction;
- employment and well-being of the poor population;
- sustainable development of the republic.

Common criteria for the three Conventions are as follows:

- level of negative impacts and expected changes;
- degree of risk;
- economic efficiency, poverty reduction and sustainable development.

Main factors for the needs assessment of vulnerability reduction/adaptation to climate change, desertification and biodiversity are as follows:

- reduce the prospective risk of negative impacts;

- increase the adaptation capacity required to reduce vulnerability of the poor population residing in rural areas;
- increase the adaptation capacity of natural resources and national economy sectors closely dependent on the environmental situation;
- implement planned measures aimed at the reduction of loss and damage.

The key directions for priority improvement and technological modernization aimed at capacity building are based on the National Action Plans (on climate change, biodiversity and desertification) because these particular documents define the state's environmental policy in the three areas.





## Results of the consultative process and analysis aimed at the identification of stakeholders

Upon the endorsement of the Tajik NCB Project Proposal by the GEF Secretariat and following the signing ceremony on May 1, 2003, the project's implementation began. In accordance with the agreement between the State Committee on Environmental Protection and Forestry and the UNDP, project staff were selected and hired, and the project implementation office identified and equipped.

Project activity was carried out in compliance with the approaches and principles set up for the NCB by GEF.

The involvement of high-level project partners was initiated from the very beginning at the project approval stage by national coordinators of the three Conventions and the National Commission on Sustainable Development (NCS).

Following the project's approval, the National Project Coordinator (NPC) informed project partners of the project goal and project implementation status. Both the NPC and the Project Manager (PM) were well aware of all relevant government planning activities aimed at avoiding overlap and providing maximum coordination of the project's implementation.

Project supervision is performed by a specially established Project Executive Committee (PEC). It has coordinated and supervised all project activities. The PEC consisted of three national coordinators, operational staff of GEF, the NPC, the PM, academicians, UNDP, NGOs and other partners.

Meetings were held at least once per quarter and were convened by the PEC chairman, represented by the NPC.

On behalf of the government of Tajikistan, the Project Executive Committee was represented by the State Committee on Environmental Protection and Forestry. The PEC was responsible for ensuring an effective coordination between various partners. The NPC had specific tasks to

meet those coordination requirements.

### Specific tasks included:

- establishment of the National Coordination Committee consisting of national coordinators and the Project Coordinator;
- establishment of the project office with the required staff;
- development and approval of the NCB process;
- adjustment and correlation of methodologies used for thematic assessment and analysis of cross-sector issues;
- elaboration of a work plan, terms of reference and their approval;
- identification of consultants and project partners, including members of relevant national commissions and representatives of donor institutions, district and local authorities, members of the private sector and NGOs;
- publishing a brochure on the NCB-planned process for project partners and other stakeholders;
- data sharing and creation of a network comprised of other NCB projects in the region aimed at experience exchange and dissemination of information on the project's progress in Tajikistan.

On July 26, 2003, the project's management organized an Introductory NCB Planning Workshop with the participation of government agencies, research and educational institutions, NGOs and international organizations.

To involve NGOs in the project's implementation and to define their roles in the NCB process, a Round Table was convened on September 30, 2003, with the participation of NGOs working in the area of climate change, biodiversity and



desertification. The questionnaire survey identified NGOs interested in the NCB project's implementation; in March - June 2004, these NGOs were invited to conduct independent surveys.

To build partnership relations and establish linkages with current projects and programs, the project's staff and the working groups participated in regional workshops, as well as national seminars and working sessions on sustainable development, climate change and biodiversity conservation. The NCB project is closely cooperating with the Aid Coordination Unit and the Monitoring Unit on the "Poverty Reduction Strategy" under the Office of the President of the Republic of Tajikistan and the NCSD.

On December 5-6, 2003, the First National Workshop on the NCB Project in Tajikistan was held, in which thematic reports were discussed and a general consensus achieved on the priority criteria in accordance with the work plan.

A cross-analysis was made on the three Conventions. The cross-analysis methodology was provided by working groups and the international project consultant. A technical workshop on "Cross-Analysis" held on March 11, 2002, with the participation of all Convention coordinators and key experts on the three thematic groups, discussed and approved of the selection criteria for priorities and methods of cross-analysis.

This cross-analysis helped identify priority directions comprising common needs in capacity building under the UN Conventions on climate change, biodiversity conservation and combating desertification. At the final stage, a draft Cross-Analysis Report was presented at the Second National Workshop on July 9-10, 2004, and the national experts elaborated on the analysis outcomes in their respective areas. The workshop provided valuable comments and feedback from project partners and other stakeholders, which were taken into consideration in the final draft of the Cross-Analysis Report.

The survey materials provided a base for the final Report and Action Plan on National Capacity Building to Implement

Commitments of the Republic of Tajikistan on Global Environmental Conventions.

The main outcomes of the "Report and Action Plan on Building National Capacity to Implement Commitments of the Republic of Tajikistan on Global Environmental Conventions" were discussed at the workshop that took place on February 4-5, 2005. All comments and feedback were carefully analyzed and, when possible, taken into account. Preparation of this document involved highly qualified experts from various ministries, institutions and NGOs with sufficient experience in the development of action plans, in cooperation with research institutions and international organizations.

Relevant activity promoting the NCB implementation in Tajikistan:

In order to raise public awareness, the project organized a Press-Club for the mass media chaired by the UN Resident Representative in Tajikistan Mr. William Paton. Expert-consultants were represented by the National Coordinator on the Convention on Biodiversity Conservation, Mr. N. Safarov, and the National Consultant on Climate Change, Mr. A. Kayumov.

A scientific-research expedition was organized with the participation of the media. This resulted in a series of articles on the problems of biodiversity conservation, combating desertification and climate change, which raised wide public interest.

To cover all groups of the population and to enhance individual and staff capacity, the project assisted in the organization of an Ecological Camp for children residing in close proximity to the protected areas national parks and reserves. Children received training relating to the issues of the three Conventions and their interrelation.

PDF-A applications on the elaboration of the mid-scale project on "Demonstration of local solutions to combat desertification and improve sustainable land resource management in South-Western Tajikistan" (estimated funding is \$1 million) were developed and submitted to GEF Secretariat. This work was carried out by national NCB project experts on desertification.





## Advantages of the PSA process

The complex of interrelated natural-climatic, socio-economic, political and intellectual elements may be described as a synergetic system used to examine the dynamic process of the socio-economic development of a society and its interaction with the environment. The PSA process's advantages are in building capacity on the basis of synergism. Capacity under the framework of the three Conventions (on climate change, biodiversity conservation and combating desertification) can be built by coordinating activities and focusing efforts to implement relevant national tasks, avoiding overlap and removing areas of conflict, and creating favorable and advantageous conditions in which the "cumulative effect exceeds a simple sum of efforts."

It is therefore very important to look for synergism in developing a national strategy for capacity building with regard to the three Conventions. Although each Convention has its own significance, objectives and commitments, all three are interrelated and interdependent. Capacity building will be aimed at identifying their common tasks. Primary attention will be focused on identifying effective ways to combine the potential of different conventions, various programs developed by ministries, institutions and NGOs in order to save time and resources in capacity building.

### Capacity building at the systemic level

This means creating favorable political, legal economic conditions and opportunities for the free interaction and successful performance of various institutions and individuals. Factors promoting national capacity building at the systemic level include international conventions and agreements, acting national legislative-legal documents, the economic environment, processes and interrelations, and system-wide resources.

The national capacity-building process with regard to the three Conventions is

closely connected to international activity. Tajikistan cannot resolve all problems of global environmental protection on its own. It is very important to define priority directions and to focus all efforts on finding solutions for the most urgent national problems. Synergism may come about in the form of an effective interrelation with international organizations, elaboration and presentation of joint complex projects reflecting the goals and objectives of all three Conventions, and in control over the targeted and effective use of allocated grants and investments. To achieve synergism, it is necessary to establish a corresponding body that will coordinate the activity of national institutions with those of international organizations, resulting in the development of important projects and allocation of required grants for the implementation of the three Conventions.

The aforementioned national laws and a number of other regulating documents, to varying degrees, reflect the main tasks and directions of the three Conventions. However, Convention materials make it clear that these laws do not have sections devoted to specific aspects of climate change or biodiversity conservation. Neither do they stipulate administrative and economic sanctions for the irregular use of land, etc.

A search for effective ways of interrelated problem-solving consists not only in the expansion and improvement of existing laws and legal norms, but also in the effective use of current legislative and legal acts. One such way is to create specific instructions (or regulations) on the rights, duties and other directives of all organizations, legal and physical persons relating to environmental protection under the three Conventions. These instructions can be issued by a relevant Department of the State Committee on Environmental Protection and Forestry or by the Ministry of Justice.

Availability of an efficient economic base is an important synergistic factor in building national capacity at the systemic level. Such



sectors of economy as hydropower, industry, agriculture and transport are key trends in the nation's economy. Significant improvement of economic indicators in these areas is a realistic potential outcome of the implementation of goals under the three Conventions, as well as the decisive factor in sustainable national development and poverty reduction.

In this regard, capacity building may be manifested by focusing efforts on the development of those economic sectors that can give fast results and become the basis for the development of other sectors. Thus, processes and interrelations on the systemic level have great significance for capacity building.

Capacity building at the institutional level. The main responsibility for environmental protection lies with the State Committee on Environmental Protection and Forestry. The State Committee consists of the central staff with certain number of departments and units, state inspectors and agencies, as well as provincial and district committees responsible for local implementation.

Other responsible bodies include the Ecological and Disaster Management Unit of the Presidential Executive Office, the Ministry of Health, Ministry of Emergencies and Civil Defense, Ministry of Agriculture, Ministry of Irrigation and Water Management and the State Land Management Committee, which are the key entities working in the area of land degradation and desertification. Efficiency of the State Land Management Committee is impeded by a number of disadvantages. The State Committee on Environmental Protection, which bears the general responsibility for environmental protection, lacks capacity to effectively coordinate the activities of other agencies responsible for ecological issues and has no access to the database. Coordination with line ministries is impeded by a weak communication infrastructure.

Thus, roles and responsibilities of various ministries and institutions in capacity building and the development of the country's economy under the three Conventions are quite complex. Tentatively, they can be divided into two groups: those

"using" natural resources (contaminating the environment) and those "protecting" it. The complex process of interrelation and interaction of these factors may very well imply synergism.

Various institutional interests and a lack of clear planning or synchronization of activities may lead to undesirable results. For example, expansion of agricultural lands results in a reduction of natural parks and reserves, and the extinction of rare animals and plants.

Implementation of the three Conventions has brought to life new forms of institutional structures.

The newly created National Center on Biological Diversity and Biological Security is turning into a significant institutional structure for building national capacity in the implementation of the Convention on biodiversity conservation and rational use. The Center has close relations with local and international organizations.

The State Land Management Committee of the Republic of Tajikistan is both the center and coordinator for combating desertification. Analyzed materials show that the committee has wide analytical capacities for the assessment of land resources; it has collected vast data, produced maps, etc. It is worth noting that the committee is not among environmental protection agencies. A difference in mandates may lead to inter-agency barriers.

A new Center on Climate Change was established on the basis of the State Hydro-Meteorological Agency under the State Committee on Environmental Protection and Forestry. This Center involves an experienced and qualified cadre of specialists, and has sufficient experience working with international organizations, national ministries and institutions. It is already experienced in organizing and conducting targeted research in the implementation of international conventions and is involving experts from various economic sectors, which also creates a basis for synergism at the institutional level.

The existence of a wide network of institutional structures (ministries, agencies, scientific and educational structures, NGOs, etc.) is a good basis for building national



capacity with regard to the implementation of the three Conventions. For instance, by planting trees along highways, the Ministry of Transport contributes to biodiversity conservation while strengthening the soil level and reducing erosion processes. This activity expands the soil's intake capacity and reduces the release of greenhouse gases. Effective and rationalized activity of the Ministry of Irrigation and Water Management combats land degradation, reduces emissions of greenhouse gases and promotes biodiversity conservation.

Capacity building under the framework of the three Conventions is based on the coordination of activities and coherence between different institutional structures.

Thus, the PSA's advantages are reflected in synergism. Synergism may emerge in a clear determination of functions and responsibilities of these institutional structures, coordination and synchronization of their activity with regard to the three Conventions, and identification of effective forms of cooperation and interaction.

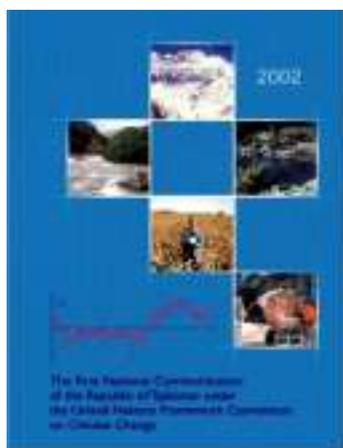


## PART 2 THEMATIC ASSESSMENT



### Summary of climate change mitigation

Tajikistan has an initial legislative and institutional base for activities in the area of climate change. The Hydro-Meteorological Agency, under the State Committee on Environmental Protection and Forestry, coordinates activities aimed at resolving problems related to climate change in Tajikistan. The structure of the Hydro-Meteorological Agency includes a special Coordination Center with permanent staff, national experts and consultants. The First



Picture 5.1 R e p u b l i c of T a j i k i s t a n on climate change mitigation

(picture 5.3). The National Action Plan of the RT on climate change mitigation was endorsed by Government Resolution #259, issued on June 6, 2003. The NAP defines key priorities and directions of the Republic of Tajikistan in resolving problems related to climate change, needs in building capacity for further studies and expansion of scientific knowledge on the climatic system, as well as main trends in international cooperation development. The NAP activity serves the basis for planning and decision-making at all government levels.

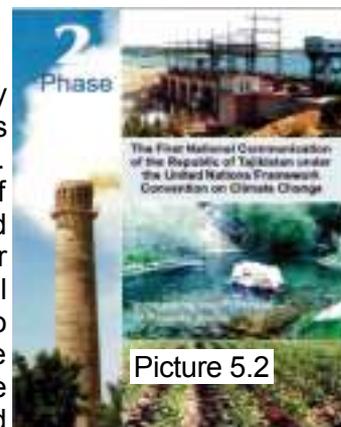
Weaknesses include the lack of an effective, transparent and well managed environmental system that would promote public involvement and use of the best international norms and practices.

Building national capacity in climate

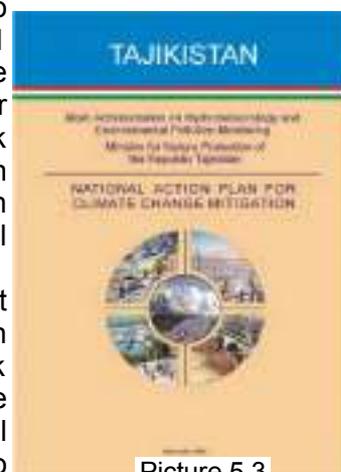
change mitigation may be impeded by various types of barriers. Assessment of potential barriers and identification of their possible solutions will make it possible to considerably reduce related risks, promote capacity building and attract investments. There are such types of barriers as legislative, financial, institutional, technological, market and informational barriers (figure 5.1). Each of them makes a negative impact on the political and socio-economic situation in the country and restrains the capacity-building process in climate change mitigation. Overcoming these barriers requires resolution of a number of problems and implementation of a number of specific tasks.

Another constraint in the improvement of the country's financial situation is the fact that Tajikistan has not joined the Kyoto Protocol and cannot participate in the implementation of the Mechanism of Clean Development projects (international quotas trade).

Quite soon Tajikistan will have to make a political decision on joining the Kyoto Protocol under the UN Framework Convention on Climate Change. On one hand, this will demonstrate the country's commitment to the implementation of the Framework Convention. On the other hand, this will create opportunities to attract investments in ecologically clean



Picture 5.2



Picture 5.3



technologies to the country's economy, contributing to sustainable development.

Utmost attention is paid to the implementation of projects on emission reduction within the context of the Millennium Development Goals as it relates to the energy sector and the protection of the atmosphere. One of the Goals is devoted to the achievement of environmental sustainability; key indicators measuring progress in this area are; (i) efficiency upgrading in power consumption per GDP unit; and (ii) reduction of carbon dioxide emissions per capita.

Power policy and energy reforms will most probably reduce energy consumption and carbon dioxide emissions in the atmosphere. They will also prove useful in environmental protection by: (Figure 1) promoting the use of cleaner types of fuel; (ii) strengthening environmental management; and (iii) removal of market barriers with regard to renewable power sources and investments in power savings.

Priority economic sectors responsible for the largest emission of greenhouse gases, and therefore requiring immediate measures to reduce emissions and increase carbon pickup, are as follows:

- production and consumption of electrical and thermal energy;
- transport;
- industrial production;
- agriculture;
- forestry and land use.

The utmost priority should be placed on measures to improve the living conditions of the population, especially the poor people, and measures promoting new, ecologically clean technologies. These include renewable energy sources. Low priority was given to the reduction of emissions in the waste sector, due to its low reduction

capacity and high cost.

Past and present surveys prove that in

Tajikistan adaptation to climate change is as an important aspect of climate change mitigation, as is the reduction of greenhouse gas emissions. Raising

public awareness through the mass media is a powerful tool in the PSA implementation in Tajikistan.

Objective information on climate change presented by mass

media is aimed at improving public

perception of the problem of climate change and providing support to the implementation of the Self-Assessment of

the National Capacity of Tajikistan in global environmental management.

Priority sectors requiring introduction of adaptation technologies are as follows:

- water economy;
- agriculture;
- transport;
- health protection;
- disaster mitigation;
- improved systematic hydro-meteorological monitoring.

Following are the identified priorities:

1. Study of water resources and improved forecasting under the conditions of climate change;
2. Use of bio-gas. Creation and introduction of bio-gas plants in farms facilities;
3. Optimized operation of hydropower facilities under the conditions of climate change;
4. Small river basin hydropower development. Assessing the hydro-resource capacity of small rivers in the proposed areas of mini (micro) power plant installation;



5. Improved disaster preparedness and mitigation;
6. Improved level of hygiene education of the population related to climate change;
7. Field-protective forestation. Creation of forest belts on arable and dry lands with the use of fast-growing trees and bushes;
8. Prophylaxis of infectious diseases, including the most dangerous and tropical infectious diseases in the context of climate change;
9. Growing hydropower capacity;
10. Capacity building in the context of the protection and rational use of land resources;
11. Capacity building in the context of the development and integration of new industrial technologies, contributing to reduced greenhouse gas emissions;

12. Rational water use in agriculture in the context of climate change;
13. Natural hydro-meteorological phenomena (NHPM);
14. Improvement of observation and prediction (IOP).

Thus, capacity building creates a basis for preparation of the following National Statements of the Republic of Tajikistan on climate change and defines priorities in the development of technological, personnel and institutional capacity, as well as ways to overcome barriers in the transfer of technologies and project implementation. The survey results help form the project's basis for a self-assessment of the national capacity (SANC) for the preservation of global environment in the thematic area of climate change.





## Summary of biodiversity conservation

The National Strategy and Action Plan includes an assessment of the present status of biological diversity, modification trends, main strategic directions of biodiversity development and activities aimed at the implementation of the Action Plan, as well as identification of economic and political mechanisms on the conservation and sustainable use of biological diversity.

Problems impeding capacity building in the area of biodiversity conservation are as follows:

- termination and/or full absence of biodiversity research at all levels;
- lack of economic calculations for funding of activities on the rational use and conservation of biological diversity;
- absence of mechanisms aimed at involving biological diversity in the economy and its needs, both in domestic and international markets;
- consideration and involvement of biological diversity as a source of raw material;
- lack of priorities in the conservation of biological diversity in legislative-legal documents.

The analysis and assessment of biodiversity in Tajikistan showed that, despite a long and successive study of biological diversity by many well-known foreign researchers, the National Academy of Sciences, individual governmental and research organizations, there are now new aspects that require a new approach in gathering biodiversity data of this unique, mountainous country. This is important for the application of international mechanisms and organization of activities on the conservation and rational use of biological resources.

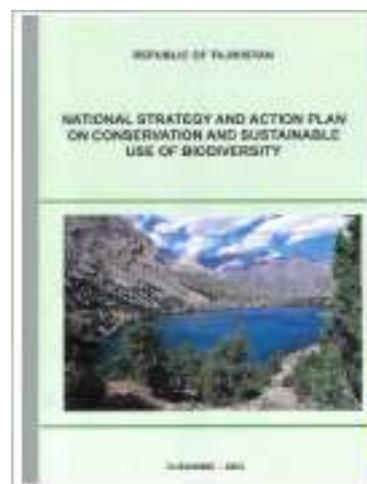
It was pointed out that an important step in capacity building in the context of

biodiversity conservation in Tajikistan is the development and endorsement of the National Plan and Strategy for biodiversity conservation and sustainable use, as well as the establishment of the National Center on biodiversity and bio-security. The National Strategy and Action Plan

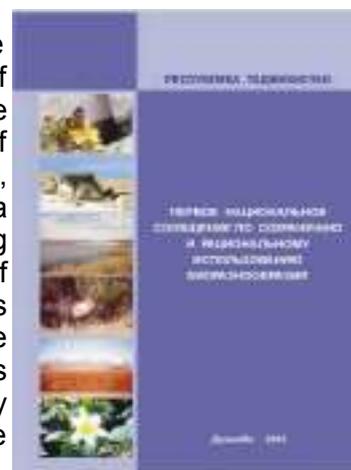
on the conservation and rational use of biological diversity of the Republic of Tajikistan (picture 6.1) are the primary documents reflecting conservation of the many components of biodiversity that have global, regional, national and local significance. The First National Statement on the conservation and rational use of biodiversity has been developed (picture 6.2).

The absence of inter-agency coordination on biodiversity conservation with other areas at different levels of the government structure, the fragmentation of contents, structure and status of biological diversity, and the lack of a unified monitoring system of biological entities in the country are the main factors impeding capacity building at the systemic level.

At the individual



Picture 6.1



Picture 6.2



level, staff education in various branches of biodiversity is completely unsatisfactory. During the past ten years, there have been fewer and fewer specialists left in the areas of preferential protection to conduct research. The number of specialists trained by higher educational institutions in the area of biodiversity is not sufficient.

Measures against the factors impeding capacity building in the area of biodiversity conservation are as follows:

- identification of strategic direction of biodiversity conservation and its rational use;
- identification of the country's priorities in the use of biological diversity;
- identification of mechanisms and principles for the rational use of biological diversity and methods of its conservation;
- collection and systematization of data, and analysis of the present status of biological diversity;
- identification of the role and place of biological diversity in the global geo-system;
- improvement of environmental protection legislation regulating the use of biological diversity.

Priorities of the Thematic Report:

Considering the natural-historical conditions of biodiversity development, the National Strategy needs to take efficient measures in the following priority directions:

- establishment of inter-agency coordinating bodies on the management of biological diversity under the framework of a unified government policy;
- improvement of the scientific-research base on biodiversity conservation and biological security;
- improvement of the management system in the existing areas of preferential protection at different levels and creation of new areas, forming an environmental body for further sustainable use of

biodiversity;

- formation of a system of biological monitoring, and creation of an electronic database and computer catalogue on biodiversity;
- restoration of degraded ecosystems according to their previous structure and functions;
- application of traditional methods of biodiversity conservation and rational use;
- elaboration of a normative base for the conservation and rational use of biological diversity, and development of economic incentives;
- improvement of the legislative base for implementing government policy in the area of biodiversity;
- strengthening of regional activity and international cooperation on biodiversity issues;
- availability of scientific data and formation of a training system for professional development;
- improvement of NGO activity and public involvement in the decision-making process on the issues of biodiversity, and ecological education of local population;
- restoration and conservation of the genetic pools of flora and fauna;
- biodiversity conservation *in-situ* and *ex-situ*;
- ensuring biological security of the country;
- sustainable use of biological resources for poverty elimination and increased well-being of the country's population.

Thus, the plan of priority actions for conservation of natural resources, rational use and restoration of biological diversity has been developed with consideration of the requirements of the Convention on Biological Diversity. It should be considered within the context of National Strategies and Action Plans on combating desertification and climate change, the National Environmental Program and other strategic documents of the republic.



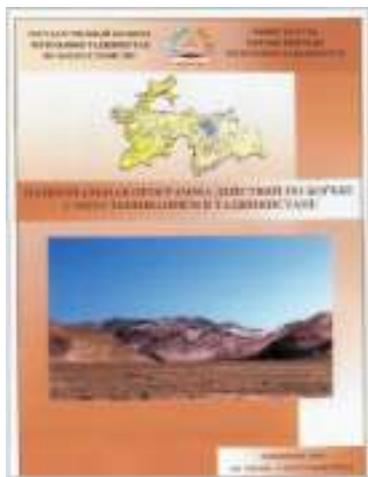


## Summary on land degradation / desertification

Implementation of the UN Convention on desertification should take into account every nation's strengths and weaknesses, which depend on socio-economic, political, environmental and other factors.

Tajikistan's strengths for capacity building: On August 12, 1998, Decree of President #1144 ratified the UN Convention on Combating Desertification. The country developed the National Program on Combating Desertification (picture 7.1) and held a number of national workshops on desertification problems in different regions of the country, involving all groups of the population, including women and young people.

All these steps demonstrate the government's concern for the preservation of natural wealth and strengthening measures against desertification, which are



Picture 7.1 with good scientific capacity. Along with

strengths, there are also weaknesses: lack of funding, lack of literature, poor attention on the part of international organizations, low awareness and a poor technical base.

Thematic Report identified the following priority directions:

1. Integration of anti-erosion and anti-deflationary activity;

2. Integration of new methods for using steep slopes and the area of dryfarming;
3. Reforestation;
4. Mapping of degraded lands;
5. Renewal of logistical-technical base of agencies involved in implementation of the NAP;
6. Reclamation of new lands and desalinization;
7. Implementation of pilot projects for combating desertification;
8. Training of highly qualified staff, both inside the country and abroad;
9. Involvement of donor countries in a joint implementation of the NAP;
10. Air-photographic operations;
11. Reforestation works; (I do not know the word 'reforestation' or what this means)
12. Community training;
13. Improvement of irrigation status of salinized, swampy and eroded lands;
14. Improvement of pastures;
15. Improvement and revision of legislative acts and regulations.

As shown by the matrix analysis, the defined priorities are of a national scale, and some of them can be defined as global. It is therefore important to involve donor countries in a joint implementation of the NAP and pilot projects. Identified priority directions have been grouped into short-term, mid-term and long-term categories. Each priority direction has its own features; some may transfer to another level, becoming more complicated.

All factors of constraint were divided in local, district, national and international types. They could be combined into financial-economic, social and political groups, which, in their turn, are divided into many subgroups.

Analysis of the root problems impeding capacity development showed that it is



foremost a lack of awareness-raising campaigns among the local population, poor knowledge of the main ideas of the UNCCD and ignorance in traditional methods of combating desertification.

At the individual level, the key role is given to changing prevailing opinions and models through education and training. Ministries and research institutions of the republic have information on various issues of desertification that is stored in their archives.

The existing data on desertification factors is out-of-date and needs to be updated. This requires new hydro-meteorological stations located in the regions of intensive soil degradation. Prediction of soil degradation due to conditions of anthropogenic activity has been carried out by research institutions for five years already. Monitoring of the rational use of land resources includes: systematic control and assessment of the present state of all types of land in combination with its soil and vegetation cover; prediction and development of erosion processes; area salting and swamping; recommendations on the reduction and elimination of negative developments and improvement of soil cover; information and experience exchange on desertification at all levels; establishment of a network of stations and

experimental grounds. It is very important to obtain satellite imagery with standard natural zones of different levels of soil degradation.

The most important parameters in monitoring desertification are: (i) rational location of the network of monitoring stations all over the country; (ii) provision of instruments and methods of quality control over the state of the environment; and (iii) creation of a justified hierarchical system of data collection, storage, transfer, processing and analysis.

The main capacity-building constraint is irregularity of public and community workshops. Training events conducted by different NGOs mostly target urban populations, donor agencies, academic circles and individuals. Local community organizations seldom become part of this process. Specialists in the problems of desertification are trained by the Tajik Agrarian University and Polytechnic College. The level of graduate knowledge does not meet modern requirements and the knowledge of foreign languages is rather poor. Training workshops are also not very effective because there is no chance to use the knowledge in practice.

Thus, capacity-building constraints in the area of desertification showed that the main impeding factors are a lack of funds and a limited access to information





## Common barriers and constraints in all three Conventions

The country developed NAP on the three Conventions and adopted various programs; however, their implementation is limited due to a number of barriers. Specifying these barriers and their impact through problem identification will make it possible to find optimal ways for their elimination and to build capacity in the context of the three Conventions.

Analysis of materials on the three Conventions helped identify the sources and negative aspects of the current situation and establish cause-and-effect relationships between the problems. It was discovered that approaches in problem identification, with regard to the three Conventions, were not the same; however, they are similar or interdependent. Since practically all aforementioned problems are brought about by economic activity, the key challenges in the context of the three Conventions are: (i) the anthropogenic factor; and (ii) natural disasters.

It has also been discovered that the environment is still subject to large-scale pressure, which is an indicator of the present status of human society. Besides, some of these factors have a substantial impact on the environment as a whole and reduce the country's capacity to provide sustainable development.

Following are the main barriers defined by thematic reports based on the analysis of the three Conventions:

- Legislative;
- Financial;
- Economic;
- technical and technological;
- informational;
- personnel.

These barriers are the main constraints in national capacity building in the context of three Conventions, which were considered and studied at the systemic, institutional

and individual levels in the thematic reports.

### Legislative Barriers

Legislative barriers are those common to all three Conventions. The Republic of Tajikistan created a legislative base regulating the issues of protection and rational use of natural resources. It includes a number of legislative and legal-normative acts.

There are quite a number of provisions, instructions, methods of loss calculation, etc. In particular, only the State Committee on Environmental Protection and Forestry developed and introduced over 13 normative and methodological documents, and two provisions on the protection and rational use of natural resources, and six legislative-normative documents on the protection and use of land. However, most of these are not in compliance with the key principles and requirements of the global environmental conventions. The laws of the Republic of Tajikistan "On Nature Protection," "On the Protection of Atmospheric Air," "On Ecological Expertise" and practically lack the section and articles on protection of vegetation and use of lands, as well as those devoted to climate change.

### Financial Barriers

A serious financial barrier is the fact that Tajikistan is not yet a party to the Kyoto Protocol, which does not make it possible for the republic to trade quotas and implement MPD projects. For Tajikistan, the Mechanism of Clean Development (MCD) is one of the main sources of financial-technical implementation to reduce emissions and improve natural carbon dioxide absorption.

### Economic Barriers

Tajikistan is an agrarian-industrial country with most of the population residing in rural areas. By the time the country gained independence, Tajikistan had been one of the most economically backward countries. Many resources have been used for the provision of political stability and resolution



of consequences of the civil war and natural disasters.

Due to the lack of financial resources, these problems reduce the chances for power sector development and an effective use of power in other branches of the economy. In addition, limited funds interfere with the development of infrastructure and communication.

#### Technological Barriers

The use of morally and physically obsolete equipment and technologies, as well as a lack of technique results in an increase of emissions and a poor quality of predictions and observations. Economic depression manifested itself in an almost complete absence of logistical and technical maintenance, reconstruction of industrial resources, leading to an increase in power consumption. In the 1990s, the efficiency of power consumption decreased ten times. One of the reasons for this is the obsolescence of technological equipment. Due to overloaded electrical grids, the accident rate, lack of maintenance and excessive operations, technological power

losses have increased considerably and reached 15%.

Introduction of advanced technologies and modernization of equipment will make it possible to reduce emissions of greenhouse gases. For example, transfer of cement production to a new "dry" method will produce a reduction in carbon dioxide (CO<sub>2</sub>) emissions of 304 a year, saving 3.68 TJ of power. Repair and replacement of the collection and drainage network and pumping stations will allow use of irrigated lands and increase agricultural production.,

#### Informational Barriers

Despite a considerable number of registered print editions, ecological and environmental issues, to say nothing of the three Conventions, are poorly covered, which impedes public involvement in the implementation of the Conventions and dissemination of reliable information. Another constraint is limited access to the Internet. This interferes with the dissemination of international data among interested government agencies and social groups.



## PART 3 CROSS ANALYSIS



### Identification of priorities

Based on the above, Tajikistan has created a legislative and institutional base for the implementation of its commitments to the three Conventions (climate change, biodiversity conservation, combating desertification/land degradation). Another important step in national capacity building is the development of the National Action Plans (NAPs) endorsed by the Resolutions of the Government of the Republic of Tajikistan.

The NAPs define key priorities and directions for the Republic of Tajikistan. The NAPs' activities are a base for planning and decision-making at all government levels. Reports and small group activities helped define common priorities in the thematic areas of climate change, biodiversity conservation, and desertification/land degradation.

Although the importance of inter-agency cooperation (involving government NGO and business-structures) is well perceived in the Republic of Tajikistan - as is reflected in official documents - the implementation mechanisms are still not developed. The same goes for mechanisms of cooperation at the institutional and individual levels. It is worth noting that inter-agency cooperation should be aimed at the achievement of common goals through a jointly integrated and mutually beneficial activity. Unfortunately, the NAP on biodiversity conservation and combating desertification did not include capacity building in the industrial sector and they limited themselves to an evaluation of its negative impact.

Considering the industrial sector as one of the more negative elements of the three Conventions, it is necessary to conduct a targeted and consistent activity aimed at reducing the harmful industrial impact on the environment.

National capacity building may become difficult due to a number of barriers of different natures. With an assessment of potential barriers and identification of

possible ways to find a solution, this may assist to reduce related risks, promote capacity building and attract investment.

Analysis of thematic reports, consultative meetings and agreements which helped identify the following common directions:

1. Forestry
2. Improved land use and irrigation of arable lands
3. Water economy and hydropower
4. Public awareness and ecological education
5. Development and promotion of legislative acts
6. Improved monitoring and data collection
7. Improved role of local self-governance bodies
8. Development of mechanisms of inter-agency coordination
9. Integration of the issues of poverty and environmental protection
10. Effective / active public participation
11. Economic instruments and sustainable funding mechanisms
12. Application of scientific studies and research data in the development of the environmental protection policy

National workshops, consultative meetings and the application of methodology which helped to identify the following priorities:

1. Effective management of power and water resources
2. Rational restoration of forests and land use
3. Coordination of actions at the inter-agency and institutional levels of monitoring and information exchange
4. Prevention and mitigation of natural disasters
5. Public involvement and participation; shared awareness and ecological education



	<b>Priorities</b>	<b>Climate</b>	<b>Desertification</b>	<b>Biodiversity</b>
1.	Inter-agency and inter-institutional coordination	+	+	+
2.	Effective use of knowledge, information and data (on climate change, biodiversity, land degradation)	+	+	+
3.	Forestry, including harvesting operations, reforestation and forest restoration	+	+	+
4.	Public participation, sharing information with partners, ecological education	+	+	+
5.	Reduced use of biomass as an energy source, especially of wood fuel, through the development of alternative energy sources	+	+	+
6.	Integration of global environmental commitments in poverty reduction activity	+	+	+
7.	Planning of the rational use of lands	+	+	+
8.	Factors stimulating and de-stimulating the market, i.e. tariffs, subsidies and economic instruments	+	+	+
9.	Increased promotion of respective legislative acts	+	+	+
10.	Low level of / unstable funding	+	+	+
11.	Absence of respective monitoring mechanisms	+	+	+
12.	Lack of attention and support on part of international community and bilateral development agencies/organizations	+	+	+
13.	Effective use of traditional knowledge and experience	-	+	+
14.	Influence of significant local, national, and international economic interests	+	-	-





## Common needs in capacity building in the priority areas under the three Conventions

### 10.1. EFFECTIVE POWER AND WATER RESOURCE MANAGEMENT

#### 10.1.1. Situation review and capacity assessment

Effective efforts for the preservation of the Global Environment very much depend on the integration of nature protective measures in different priority directions. In the context of Tajikistan, possibilities for a solution related to combined implementation of the three global environmental Conventions (climate change, desertification, and biodiversity) mostly depend on the rational use of water and power resources. Having an adequate attitude to water resources and their effective a necessary management is precondition for the respective measures aimed at the implementation of the three Conventions because water resources (picture 10.1.1) are an integral component of the environment and, at the same time, an extremely important and ecologically clean power source.

With the limited availability of other energy resources, development of hydropower and renewable/alternative power sources is a very important element for the sustainable development of our country. Furthermore, this is directly linked to the effective implementation of the Conventions on desertification, climate change, and biodiversity.

Due to its climate and orography, Tajikistan is a large area of focus for the contemporary glaciation of Central Asia. Glaciers are greatly valuable for Tajikistan

since they are not only storages of fresh water but also regulators of river flow. Glaciers cover the area of  $8,0\pm 0,4$  thousand  $\text{km}^2$  or 6% of the country's territory.

There are 947 rivers over 10 km long. The total length of all rivers is 28,500 km. The average annual flow from 1  $\text{km}^2$  of the central mountainous region of the country is 30-45 liters/second. According to the latest data, average annual flow is around  $53 \text{ km}^3$ . The main flow is formed in the Pianj and Vakhsh River Basins.

National water use is connected with a number of factors the low technical condition of the irrigation structure which results in a loss of water, poor water resource management, lack of an effective regulating system as well as incentives/fines for economy/excessive use of water resources. Water use efficiency in agricultural fields is only 20%, and very rarely reaching 40%.

It is obvious that until the water use and crop rotation practices do not change, the country will face salination of soil and underground water resulting in the loss of arable lands which in the next decades will be unsuitable for agriculture.

Picture 10.1.1 The same concern is required for areas with high levels of salination in lower areas which make water unsuitable for drinking and irrigation.

In the context of land degradation, climate change, and biodiversity conservation, water resource management plays a very important role.



Water resource management requires resolving a great number of problems - none of which have a simple or univocal solution:

- problems of effective water use in irrigation;
- problems of water distribution at the national and regional levels;
- fresh and drinking watersupply;
- policy of the national and regional water use;
- problem of contamination of water resources;
- problems of regulation of riverflows.

In approximately one third of all irrigated lands, the level of underground water is located three or fewer meters under the surface. Swamping creates a problem of secondary salination. Each year, agriculture is losing around 4-5 thousand hectares due to salination and swamping. This also creates a negative impact on climate and biodiversity.

Rehabilitation and rational use of the irrigation system will have a positive impact not only on the preservation of water resources but also on the implementation of the three Conventions, i.e. on biodiversity conservation, mitigation of climate change and prevention of desertification.

Water resources are the basis for hydropower in Tajikistan. Total potential hydropower resources amount to 527 billion kW/h; of these at least 40%-50% are technically applicable for electrical power production. Over 95% of all hydropower

in the republic is produced by hydropower stations (picture 10.1.2).

In the context of the anthropogenic impact on global environment, the decisive role lies within the energy sector's activities. Emission of greenhouse and other harmful gases is mostly connected with the burning of fossil fuels (including transport). Construction of big hydropower stations

leaves huge territories underwater. In order to try to satisfy its energy needs, the population cuts forests and other vegetation which leads to erosion, extermination of biodiversity, etc.



Picture 10.1.2

Thus, energy activity and energy supply, on the one hand, are a decisive factor of stable development, and on the other, make a devastating impact upon the environment. Therefore, one of the main problems of contemporary society is to provide a stable socio-economic development in harmony with nature, with the preservation and rational use of natural resources, including the energy sector.

In the context of global environmental protection, commitments to the International Conventions, reduced emissions of greenhouse gases and other contaminating substances, exploitation, processing and use of mineral fuel resources are not among the priorities. However, in the interests of economic growth and the population well-being, especially in the period of transitional economy, it is most important to effectively and rationally use all resources, including increased exploitation, processing and use of local fossil fuels and ensuring import independence of the republic on these types of fuel.

Based on the above, the priority energy source in Tajikistan (for the immediate future) is hydropower.

In Tajikistan, unique hydropower stations built where large rivers flow into deep rock canyons have not only hydropower but also water-regulating and irrigational

*No measures in the context of the Conventions on climate change, desertification and biodiversity will be effective unless the population is provided with energy resources. Provision of alternative/renewable power sources in the situation of widely spread poverty is of utmost importance.*



significance. It is obvious that hydropower resources are renewable and safe from the point of view of greenhouse emissions and other dangerous substances. In the case of Tajikistan, all these characteristics make traditional hydropower a non-competitive energy source.

Mainly, hydropower resources are concentrated at the biggest rivers Vakhsh, Pianj, Obihingou and others. Specific intensity of potential hydropower resources is highly impressive 3,682.7 kW/h per 1 sq. km (the world's highest) and per capita 87,800 kW/h (among the world's highest). However, during the past few years, due to irrational use, the energy is not sufficient which provides a negative impact on the socio-economic development of the republic and the well-being of the population.

Existing power plants (PP) of the republic produce over 15 billion kW/year (Table 10.1). However, in winter time, PPs do not use their full capacity (due to water saving). Compared to 1990 (around 18 billion kW/h), power production reduced to 14-16 billion kW/h (1999-2003). In the summers, Nurek PP, has a designed capacity of 2.7 billion

kW/h, and produces the required power and water for irrigation. Yet in winter, due to a lack of water, it does not utilize its full capacity. This leads to regular shutdowns of users and results in an increased use of biomass.

Construction of Rogun and Sangtuda PP could considerably improve the powersupply situation. However, even with the operation of these hydropower stations, the power supply problem of many remote mountainous areas that are not connected to the centralized grid will remain unsolved. Here an effective solution is the construction of mini and micro (MINI AND MACRO MEAN THE SAME THING, DON'T THEY?!) hydropower stations.

Expert calculations show the economic efficiency of small rivers and catchment areas for the construction of mini-PPs with the capacity of 1,000 kW. Though small river resources constitute only 5% of the country hydropower potential, reclamation of only 10% of the hydropower

*The 1980 situation analysis shows that even with the minimum power supply of the population, preservation of environment, especially of the vegetation, will considerably improve.*

Table 10.1.

Dynamics of Electrical Power Production in Tajikistan (in billion kW/h)

Power production	1990	1998	1999	2000	2001	2002	2003
Total	18,15	14,42	15,79	14,25	14,38	15,30	16,51

Sources: Tajikistan in Digits, Dushanbe, 2004.

Table 10.2.

Hydropower capacity of mountain rivers of tajikistan

Potential river capacity, thousand kW/h	Number of rivers	Capacity Million kW/h	%
Over 500	7	20,0	62,1
100-500	28	6,0	18,7
50-100	44	3,0	9,2
25-50	135	2,1	6,7
5-10	137	0,626	2,0
Less than 5	190	0,439	1,3
<b>Total</b>	<b>541</b>	<b>32,2</b>	<b>100,0</b>

Source: Ministry of Energy of the RT



capacity of small rivers in the mid-mountain and high-mountain belts will be able to provide electricity to 70% of local settlements and agricultural facilities. These are all opportunities for construction of mini-hydro local construction materials, labor resources, etc. Additionally, they have a quick return on investments (4-7 years).

Construction of mini and micro PPs does not flood big areas and does not influence the underground water level - which is in full compliance with the three Conventions.

Thus, despite the complicated political, socio-economic, financial, and technological challenges, Tajikistan still has a whole spectrum of unused resources and potential opportunities. These opportunities relate to national capacity building in the context of the three Conventions, as well as to the solution of the problem of sustainable socio-economic development, improvement of the living standard and poverty reduction (picture 10.1). Fuel and power resources of Tajikistan play a significant role in this regard.

Tajikistan has great opportunities in the use of non-traditional sources of renewable energy, such as biogas. Areas with developed agricultural activity could make use of bio-fuels (lignum fossil, chips, dung, and other agricultural wastes).

The use of bio-energy facilities is especially productive near large cattle and poultry farms where aside from power there is a real need to utilize agricultural wastes.

It is interesting to note that despite the existing potential energy resources (fossil fuel, hydropower, alternative power sources), the level of power supply in Tajikistan is very low (four times lower than in other Central Asian countries and ten times lower than in Europe).

According to statistical data, during the past 10 years, the supply of coal, oil and gas has considerably reduced. It also relates to the livestock population, cotton crops including collection of cotton stems, vineyards and fruit trees whose wastes were also used for fuel.

This makes the situation even worse and makes people use vegetation, including fruit trees, thereby accelerating the pressure on

environment. Even in the areas traditionally supposed to be "fuel safe" such as Shaartuz (always well supplied with cotton stems), population practically destroyed artificial plantations of saxaul, and in Murgab they destroyed teresken.

As was mentioned, the use of vegetation as a fuel source is a direct act of biodiversity elimination contributing to land degradation and desertification. Besides, in the conditions of artificial irrigation when vast massifs of land are irrigated by pumps, power supply issues become direct factors of land use.

Any technological problem such as creating a unified system for monitoring, information, control and such cannot be solved without a stable power supply. A lot of infrastructure is not operational now or is partially operational. Even school computers and hospital equipment are not utilized due to a lack of power which provides a negative impact on the sustainable development of the country.

*Every year the population "burns away" 4-5 million tons of green biomass bringing a heavy damage to nature (we are speaking not of natural, renewable wastes but living green biomass) and resulting in the destruction of a rare forest cover, exposure of mountain slopes, increased debris flows and soil erosion and, finally, in desertification of large territories, decreased absorbing capacity of emissions and elimination of biodiversity.*

Therefore, improvement of power supply should become one of the key priorities of national capacity building in the area of global environmental protection.

#### **10.1.2. Priority needs and measures aimed at capacity building for an effective power and water resource management**

Basic energy needs of the world community are satisfied at the expense of burning fossil fuels (oil, gas, coal) accompanied by the emissions of billion tons of greenhouse gases. Their concentration in the atmosphere leads to global climate change, land degradation, and deterioration of biodiversity.

Power consumption in Tajikistan considerably varies from average world



indicators because the hydropower share constitutes 60-75% of total power consumption, excluding biomass (for comparison hydropower share in the world power consumption structure is only 2%).

The potential for reduced emissions of anthropogenic substances in the atmosphere through power policy reforms and investments is tremendous.

Hydropower is based on the use of renewable hydropower resources and is not accompanied by emissions of contaminating substances. The existing level of consumption replaces the use of fossil fuels in the amount of 1.86 million tons. This accounts for low emissions of anthropogenic substances in Tajikistan. In particular, with regard to the greenhouse gas emissions, mostly CO<sub>2</sub>, Tajikistan has the most favorable position among the countries of Central and Eastern Europe, the Caucasus and Central Asia.

Energy sector development in Tajikistan, providing sustainable development, is defined by ecological and economic factors.

Besides reforms and policy improvements in the energy sector, technological measures may also considerably promote implementation of priority tasks in the area of desertification and climate change.

The key priority is the development of hydropower potential and infrastructure for hydropower supply, especially in rural and remote areas.

The main technological needs are as follows:

- rehabilitation of operational PPs and modernization of thermal stations;
- construction of new PPs of the Vakhsh Cascade, primarily Rogun and Sangtuda hydropower stations;
- construction of mini-PPs in the Pamir Mountains;
- construction of mini-PPs and an expanded use of non-traditional renewable sources of energy;
- rehabilitation of energy infrastructure in rural areas.

Attracting international investments in the construction of new large power plants

and rehabilitation of the existing power infrastructure will provide a considerable reduction of potential emissions of contaminating substances. The use of hydropower capacity will increase twice and will become equivalent to the use of 4-5 million tons of fossil fuel annually. The payoff period will be 5-10 years. Operational period will be 50 years. Implementation of the planned investment projects will be very important for the social sector, industrial development, and will make it possible to increase the export of ecologically clean energy to neighboring countries that will also lead to reduced emissions in the importing states.

In the context of the three Conventions, the most important is the aspect of poverty reduction since this is the key factor for the creation of adequate electricity tariffs and prevention of a negative impact on natural resources, mainly forests that are now actively used for fuel.

The rational use of water resources is among the most important directions for combating desertification and adaptation to climate change. This direction requires adoption of certain measures at different levels, inter-agency coherence and a firm economic justification (figure 10.1.1). It is worth restating that hydropower constructions may play a negative role in biodiversity conservation resulting in a fragmentation of ecosystems and violating natural migration routes.

At the system level, it is necessary to improve the legislative and normative base aimed at its *From the perspective of environmental protection and mitigation of climate change, land resources and biodiversity, the hydropower share should constitute at least 60-70%.* maximum adaptation to the implementation tasks of the global environmental conventions. One of the measures strengthening the legislative base is the introduction of amendments to the Law of the Republic of Tajikistan "On Nature Protection" so that it corresponds the key principles of global environmental Conventions. It is necessary to provide normative support of both physical and legislative changes in the system of water use.

An indispensable condition of capacity building at the individual level is the



improvement of the level of education and the awareness of decision-makers.

Of utmost importance are measures aimed at the rationalization of water use and its increased effectiveness (growing efficiency of irrigation systems, integration of new irrigation methods, closed drainage systems) and integrated management of water resources. To reduce the NHPM loss in the water sector, it is important to ensure the construction of bank protection and anti-mudflow structures and their effectiveness.

Improved water resource management may provide water saving and socio-economic benefits. Introduction of tariffs for water irrigation will promote a reduced use of water resources by 30% which is a more effective approach in water resource management.

The main needs of capacity building in water resource management include:

- automatic performance of the water

- rehabilitation and reconstruction of irrigation systems to avoid water loss through filtration and evaporation; stimulating water-saving technologies in industry and agriculture;
- transfer to an expanded use of a closed drainage network and repeated use of cleaned drainage waters; creating a network of reservoirs in agricultural areas to provide guaranteed water resources in dry years and mitigating catastrophic floods;
- stabilization and strengthening river beds prone to floods, water erosion and wandering;
- improvement of the anti-debris flow and river bank protection structures;
- modernization of water supply

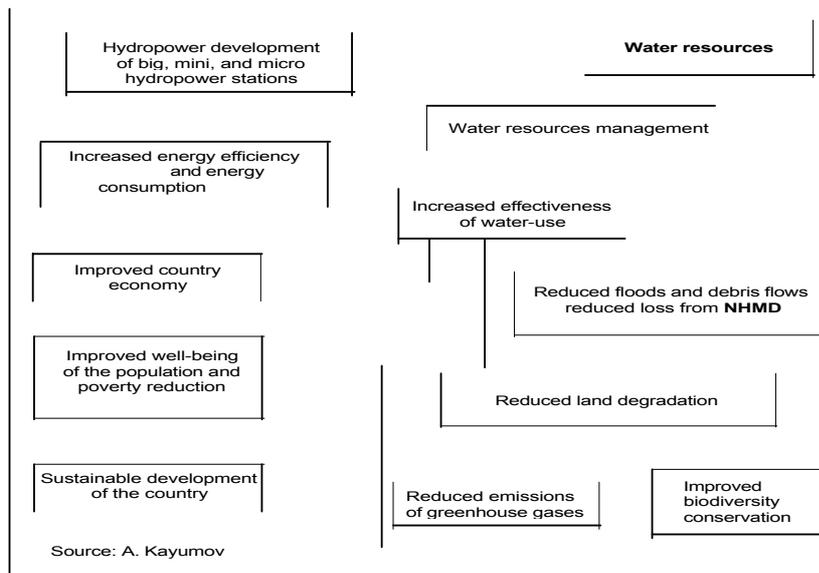


Figure 10.1.1.

distribution systems, water balance inventory and consumption with the use of the GIS technology;

- increased efficiency of irrigation systems and introduction of progressive methods of irrigation and watersaving;

systems providing high quality water and waste-water treatment in urban areas;

- creation of transit bio-filtration reservoirs treating water from toxic agents;
- expansion of bank protective forestation.



## 10.2. RATIONAL FORESTATION AND LAND USE

### 10.2.1. Situation review and capacity assessment

During the past few years, certain areas of soil have been suffering from excessive agrocoenosis and degumming, especially in irrigated areas. This is the result of fertilizer application, full crop rotation and irrational agriculture (figure 10.2.1). Soil degradation leads to a

*All pasture lands in Tajikistan are prone to soil erosion (89% of summer 97% of winter and 87% of spring-autumn pastures suffer from mild and strong erosion).*

decrease of food products, deterioration of the living standard and is one of the reasons behind the population migration. Inconsistent plowing at the expense of forests and violation of agro-technical regulations under the dissected relief activates erosion and leads to natural disasters.

Development of erosion processes depends on a combination of natural and anthropogenic factors. Of the many reasons behind soil erosion there are always a few that prevail; however, this is always a result of geo-morphological, soil-cover, climate, and economy conditions. Their combination defines the risk and the intensity of a specific type of soil erosion.

Development of erosion processes is to a large extent predetermined by climatic conditions, especially by atmospheric precipitation. Distribution of precipitations on the territory of the republic is uneven. Most of them are characteristic for the winter spring period which contributes to the formation of an intense surface flow resulting in the appearance of many linear forms. Aside from the average annual and daily precipitation, soil erosion also depends on its intensity: high intensity increases the

kinetic energy of rain drops that destroy the soil structure and decrease water permeability. As a result, the surface water washes away the vegetable soil leaving behind drainage lines that later serve as spillways. This type of relief is characteristic for Dangara, Sovetsky, Faizabad, and other districts.

Water erosion caused by rain and storm waters is common to all areas except high mountains (above 2,500m) where most atmospheric precipitation falls in the form of snow or low intensity rains: these areas are characterized by soil movements caused by water from melted snow.

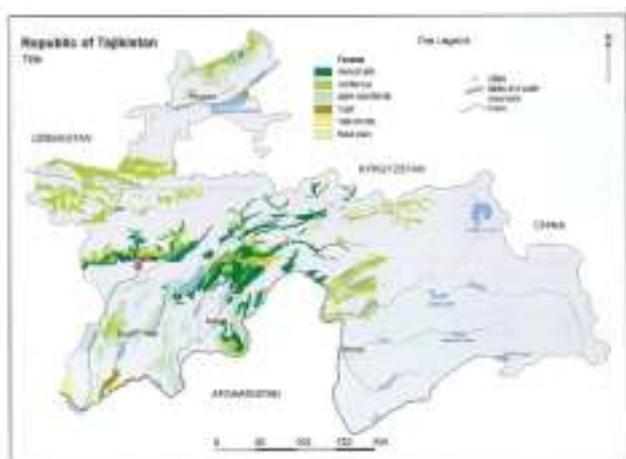


Figure 10.2.1

Formation of the surface flow and soil erosion in mountain areas is greatly influenced by daily precipitation from spring months (April-May) and early summer (June).

According to the State Hydro-Meteorological Agency, in 1999

the country received 80% of the regular precipitation; in 2000 40-65%, and in 2001 - 40-60% of the norm.

Due to weather conditions, the country has to replant crops in a territory of over 70 thousand ha which reduces the land's productivity.

For example, in 1992, the cotton yield was 18.0 c/ha, in 1999, due to weather conditions, it dropped to 12.7 c/ha/

It is widely spread in GBAO (around 40%), Vakhsh (around 24%) and northern areas (around 23%).

Overgrazing leads to a reduced anti-

*In Tajikistan, soil erosion is caused by a dissected relief, storm rainfalls and low forest density. The total area of eroded lands is over 9 million ha (over 60% of the country territory). Every year, arable lands are losing over 50 million tons of soil, including 1 million tons of humus.*



erosion quality of grass cover, it interferes with plant formation, destroys one group of plants and checks the growth of others, and the soil relatively easily becomes subjected to destructive processes. Soil loss and diminishing effects not only quantitatively indicates the pasture plants but also leads to an altered plant formation. Since plants have a different adaptability to unfavorable soil conditions (including erosion), some plants are replaced by others. Some strongly eroded sites that suffered from overgrazing and elimination of grass dissected by

result of erosion and land degradation.

Forests are an important accumulator of carbon dioxide. In Tajikistan, forests cover the area of 410 thousand ha; percentage of



Figure 10.2.2.

44

cover are heavily erosive formations and, eventually, become unused lands. Here, soil loss reaches 4.7 thousand m<sup>3</sup>/ha.

Intense irrational use of pastures leads to quite a number of negative results. Open forests are intensively used as winter and

*Forest and wood harvesting in populated and mountainous areas redoubles the problem of desertification. In some areas it influenced on the character of the surface flow and biodiversity and has become the main reason of the decreased biomass buildup resulting in a reduced accumulation of CO<sub>2</sub>.*

sometimes summer pastures where cattle completely destroys forest cover, perennial grass vegetation and ephemerals (coming out in December-April). This prevents the restoration of forests and grass cover and mountain slopes become more and more eroded and depleted.

Due to a reduced biomass buildup and general deterioration of land, tree and shrub species, certain areas of soil lose their ability to accumulate carbon which leads to an increase of carbon emissions from soil as a

forested land is 3% (figure 10.2.2). Tajik forests are diverse and are represented by 268 species of trees and shrubs many of which are of great environmental and economic

value. Forests in Tajikistan are characterized by a low productivity: an average forest yield per 1 hectare is 13.3 cubic meters. The country's forests are mostly located in the mountain belt and perform anti-erosion, soil-protective and water-regulating functions. They are sources of technical raw material and a place for biodiversity development.

Reduced soil accumulation of CO<sub>2</sub> has been recently noticed due to the deterioration of the irrigational status of lands and of soil de-gumming. According to expert opinion, annual loss of humus by dry land

agriculture amounts to 1 million tons. This resulted in an increased (4.5 times) CO<sub>2</sub> emission from exploited wild lands compared to the base period of 2000.



Figure 10.2.1

If no measures are taken, by 2015 CO<sub>2</sub> emissions will reach 300 thousand tons a year and accumulation of carbon dioxide will decrease by 30-40% compared to 2000. In



2000, compared to 1990, carbon accumulation by forests decreased by 35%, mostly due to the extraction of fast-growing trees and a poor density of forest ranges.

### 10.2.2. Priority needs and measures aimed at capacity building for a rational reforestation and land use

Historical trends of agricultural production in some areas of the country do not always meet the requirements of modern agricultural development; therefore, nature capacities are not used to their full advantage. That is why the implementation of measures aimed at the rational use of soil cover is one of the most important tasks now.

Environmental protection and resolving the problems of climate change, combating desertification, and biodiversity conservation require the integration and development of the best practices of land use and effective forestry (10.2.1).

Agricultural soils subjected to intense farming as well as forest ranges and other tree biomass are natural absorbents and accumulators of carbon as well as a biodiversity area. Land degradation and de-gumming, and the utilization of trees and shrubs result not only in a loss of carbon but also in reduced biodiversity.

#### Increase of land fertility requires the following measures:

- agro-irrigational;
- agro-meteorological;
- selection;
- soil-protection and forest-protection;
- hydro-irrigational.

Rational and effective use of arable and pasture lands, improvement of their irrigational status and application of advanced technologies of agricultural production will promote an increased carbon absorption by soil in the amount of 300-400 thousand tons per year.

Implementation of forest restoration works and integration of new technologies requires the use of the existing capacity of five forest nurseries with an annual production of over 2 million seedlings. In the nearest perspective, attention will be paid to a regular practice of sapling production by forest farms.

The dynamics of these processes depends on human activity and on the rational economy, including the dynamics of the erosion process, plowing capacities and compliance with the agricultural production technology, forester conditions and annual volumes of saplings.

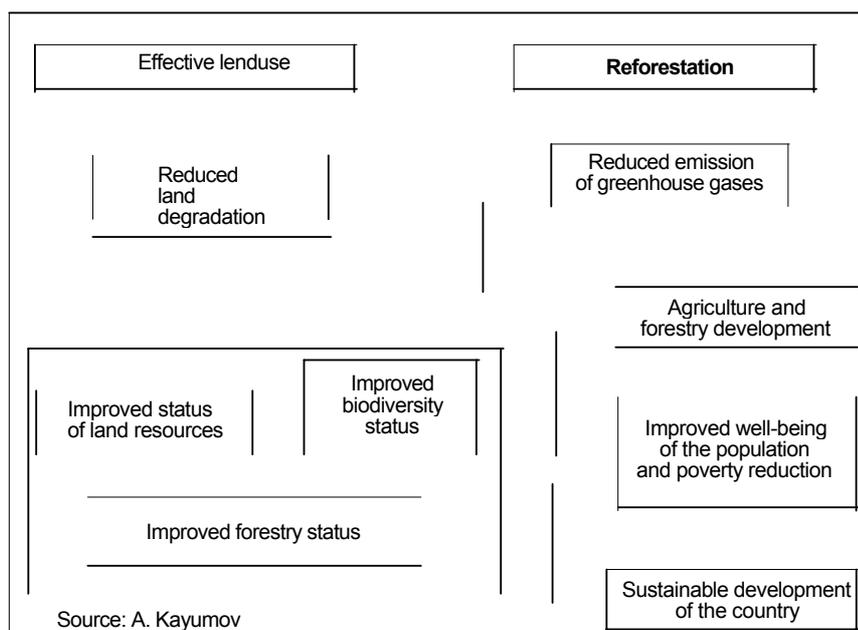


Figure 10.2.3.



Mountain slopes with an incline exceeding 13 degrees cannot be used for the production of annual agricultural crops. These lands could be used for terrace agriculture and could be planted with fruit trees and vineyard. Slopes which are less steep could be used for cross plowing combined with soil-protection agricultural systems.

Cultivation of soil-amendment crops (Lucerne), optimal rotating crops with the introduction of landscape agriculture will help preventing the loss of humus and carbon emission from soil. The largest amounts of carbon are present in soil with a substantial cumulative concentration of underground biomass.

Regular agricultural reclamation and irrigation of gypsum-bearing soils increases their biological activity, humus and carbon concentration. To raise the fertility of these types of soil, currently reclaimed in southern areas of the country, it is recommended to maintain a short rotation of cotton/Lucerne crops and to apply organic fertilizers. Under the framework of land reform and the development of farming enterprises, it is advisable to improve the system of pasture rotation and regulate their use through a land use tax.

Capacity building measures in the area of land use and forestry may be aimed at:

- combating erosion processes, land

salinity and swamping;

- prohibiting to cultivate annual crops at the slopes with the steepness of over 13 degrees;
- putting an end to illegal deforestation through the provision of the population with alternative power resources replacing fuel wood;
- forestation and forest breeding;
- field-protective forestation;
- settlement and road gardening;
- forest protection against insects, diseases and fires;
- improvement of legislative-legal base.

The above measures should be implemented in the context of the existing and elaborated national strategies and development plans in the area of the rational use of nature, and the National Action Plans under the framework of the three Conventions.

Aside from the ecological benefits, these measures provide the required level of absorption and accumulation of CO<sub>2</sub>, improve agro-irrigational status of soils and biodiversity conservation, promote socio-economic development of the country making a positive impact on sustainable development and poverty reduction (figure 10.2.3).

### 10.3. COORDINATING ACTIVITIES AT THE CROSS-SECTOR AND INSTITUTIONAL LEVELS BASED ON MONITORING AND INFORMATION EXCHANGE

#### 10.3.1. Situation review and capacity assessment

Cross-sector coordination is one of the key priorities identified during thematic reviews and cross analysis.

In order to coordinate activities under the three Conventions, it is necessary to organize a unified system of monitoring and information exchange. This requires involvement from the existing structures because it will save resources and will make it possible to use the current country

capacity. Their effective performance requires a strengthening of their capacity at the individual and institutional levels.

It would be rational to use the existing Systematic Monitoring Network of the State Hydro-Meteorological Agency/Survey under the State Committee on Environmental Protection and Forestry.

The National Hydro-Meteorological Survey (NHMS) of Tajikistan is a specially authorized government agency implementing systematic monitoring of the



climate system and environment. Monitoring data is used for mitigating the loss of natural hydro-meteorological phenomena and prevention of the negative impact of anthropogenic activity on environment (picture 10.3.1).

End-users of the meteorological information are:

- country population through mass media;
- national legislative and executive bodies;
- law enforcement structures;
- transport structures;
- agencies responsible for prevention and mitigation of emergency situations;
- regional HMS and world hydro-meteorological centers;
- agriculture;
- fuel & energy complex (???? Complex???)
- construction agencies;
- communal services;
- others.



Picture 10.3.1

Ways to disseminate information are as follows:

- daily hydro-meteorological bulletin;
- weather forecast broadcasted by radio and TV several times a day, as well as warnings on hazardous weather phenomena;

communication via teletype, telephone and E-mail;  
selected requests and calculations for end-users.



Picture 10.3.2

Following are various types of monitoring performed by the NHMS that are important for the implementation of the three Conventions:

- surface meteorological;
- hydrological;
- glacial;
- agro-meteorological;
- actinometric and thermal-balanced;
- air-ecological;
- meteorological radio-location;
- ozonometric;
- monitoring contamination of atmosphere, water, land, snow cover, and vegetation.

The network of hydro-meteorological monitoring in Tajikistan was developed, first of all, to satisfy the needs of the country's economy in hydro-meteorological information and economy planning as well as to take decisions mitigating unfavorable hydro-meteorological phenomena. At present, the network consists of 58 hydro-meteorological stations and 126 hydrological, meteorological and agro-



meteorological posts and check points monitoring environmental contamination.

Recently, the country has begun to develop a network of automatic meteorological weather stations (AMWS), both in remote mountain areas (picture 10.3.2) and in highly populated rural areas of the republic. There are 9 AMWS installed in different high climatic zones.

### **10.3.2. Priority needs and measures aimed at capacity building to coordinate activities at the cross-sector and institutional level based on monitoring and information exchange**

Improvement of regular monitoring of the climate system is determined by the Framework Convention (Article 5) as one of the priority directions in the investigation of global climate, indicators of its change and its respective impacts.

Hydro-meteorological information is required for sustainable agriculture, decisions on optimal planting and harvest dates, protection of crops against hail, designing buildings, bridges and channels, safety of cargo and passenger transportation, etc. Registration and forecasting natural hydro-meteorological phenomena reduce the level and scale of their negative impact and make it possible to prevent damage. Based on the above, hydro-meteorological information is a very important factor for taking adequate measures in the implementation of the three Conventions and realization of the self-assessment of the national capacity (SANC) of Tajikistan.

Key needs in capacity building in the context of the SANC implementation in Tajikistan include:

1. Assistance in training professional cadre in the NHMS and other training centers abroad.
2. Procurement of updated monitoring instruments and equipment for the net.
3. Improved consumer services and provision of equipment for data processing and dissemination under the three Conventions.

4. Improved system of forecast and early warning, including access to satellite data, long-term weather forecast and the development of a network of remote observations on the basis of automatic weather stations.

5. Joint research and implementation of targeted projects, including the assessment of the status and dynamics of glaciers, development of a GIS database on mudflows, avalanches, floods, and land degradation.

Considering the importance of agro-meteorological observations for sustainable agriculture and a high value of instrumental monitoring of plant phenology which is a characteristic indicator of climate change, biodiversity status and land degradation process, it is necessary to:

- restore observations by the network of posts and stations, especially in disaster prone areas and in zones highly vulnerable to climate change and desertification;
- introduce updated methodologies of forecasting and modeling the status and productivity of vegetation cover for the implementation of the Conventions on biodiversity and combating desertification;
- restore air-visual observations of pasture vegetation with the application of saving methods aimed at the adequate implementation of the Conventions on biodiversity and combating desertification;
- receive data from the satellite system monitoring the Earth surface (monitoring of vegetation and soil cover) and use of updated computer equipment for decoding and processing information from satellites;
- develop and integrate effective mechanisms of interaction with end-users of agro-meteorological information and stimulate the network of voluntary observers in agricultural areas, especially in the dry plain and mountain zones of the country.



To improve and ensure automatic data processing, storage and dissemination in the context of the three Conventions, it is necessary to:

- introduce a computerized system capable to forecast weather conditions and riverflow on the basis of digitized information received from satellites and ground observations, especially in mountainous areas;
- create a database containing hydro-meteorological observations and information on the contamination of environment with perfect mechanisms of time and space control and data reporting and to provide stakeholders with an access to this data;
- integrate the existing monitoring systems of biological diversity, desertification and hydro-meteorology into the system of combined (unified) monitoring and data gathering.

## 10.4. DISASTER PREVENTION AND MITIGATION

### 10.4.1. Situation review and capacity assessment

Capacity building in disaster prevention and mitigation is of special importance to the implementation of the Conventions on climate change, biodiversity conservation and combating desertification, and is one of the significant priorities in the SANC process in Tajikistan. This priority clearly demonstrates the interrelation of the three Conventions and proves that capacity building taken in the context of individual or all

or all three Conventions requires their coordination.

In Tajikistan, natural disasters, such as catastrophic floods, debris flows, landslides, and draught are mostly accounted for by climatic factors. Every year they bring a significant material damage and cause human

*An outburst of Lake Sarez creates a flood danger to 116 settlements. Also flooded will be thousands of hectares of arable lands; the landscape will suffer a considerable change, and irrecoverable damage will be impaired to the area biodiversity.*



casualties. Other dangerous meteorological phenomena, such as hail, intensive precipitation, strong winds and fog are also important hazardous factors in the context of the three Conventions. Many natural disasters related to extreme weather phenomena are the consequences of the global climate change; on the national and local levels they influence land degradation and biodiversity loss (picture 10.4.1). Their unexpectedness and unpredictability make them rather difficult to adapt. In 1991-2000, over 90% of natural disaster victims lost their lives as a result of severe meteorological and hydrological hazards. During this period of time, the number of meteorological and hydrological disasters, including draught, debris flows and floods was going up. According to the predictions of the WMO, the next 10-20 years will witness an increase

*38% of hazardous processes in the republic are landslides, 31 - debris flows and floods, and 21 -*



of natural hazards such as floods and draughts.

Each year Tajikistan suffers from natural disasters resulting in human casualties. Over 50% of hazardous processes have been registered in the Regions of Republican Subordination (RRS), with a little less in the Gorno-Badakhshan Autonomous Oblast (GBAO). Formation and development of hazardous processes is closely connected with hydro-meteorological phenomena, such as intensive precipitation, rapid change of temperature, snow melting and others.

Another reason for catastrophic mudflows and floods is related to an outburst



Picture 10.4.2

of glacial and dam lakes prevailing in mountainous areas of Tajikistan.

One more dangerous site in the Pamirs is the Vanch River Valley: once every 10-15 years, the pulsating Medvezhy Glacier in the upstream of the Vanch River creates a lake with a volume of 3-4 million cubic meters. The creation and outbursts of the glacial lake were observed in 1963, 1973, 1989. The wave level reached 3-10 meters. Only updated preventive measures made it possible to avoid catastrophic consequences; otherwise the hazard threatens 5,000 people in 18 villages.

In Sogd Province, the overall number of hazardous processes is around 350. Most of them (77%) are landslides, mudflows, and floods of them 55% are in the Aini and Penjikent districts.

In the Khatlon Province, there have been 342 registered hazardous processes. 57%

of dangerous and especially dangerous processes occur in Farhor, Khovaling, and Vose districts. The flood areas include the settlements and agricultural lands of the Shaartuz and Kabodiyon districts.

*Most human casualties were caused by catastrophic mudflows resulting from outbursts of temporary lakes or intensive rains. Total number of human casualties caused by mudflows in 1996-2002 was 261.*

In GBAO, 90% of the registered 277 hazardous process are landslides, mudflows and floods. Most of them occurred in Darvoz, Vanch, Rushan. and Ishkashim districts.

In total, 803 hazardous processes were registered in the RRS valleys. Landslides, debris flows, floods, and erosion processes constitute 90% of the overall figure. Most of them take place in the hazardous zones of the Shahrinav, Varzob, Kofirnigan and Faizabad districts. The capital city of Dushanbe is also part of this zone. Every year, following heavy showers, mudflows run along the streets and highways (???) WISH TAJIKISTAN HAD HIGHWAYS! THEY ARE MORE LIKE "LOW NO-WAYS" of the northern and north-eastern parts of the city (picture 10.4.2) making considerable damage to the country's economy.

According to the plan, by 2004 8,000 households should be relocated from dangerous zones; of them 28% will be in Sogd Province, 20% in Khatlon Province, 40% in the Regions of Republican Subordination, and 2% in GBAO. However, at present, only 20% have been relocated.

Considering the annual loss (to economy and nature) and the number of dangerous processes, in the early 1990s the country developed a program aimed at the prevention and liquidation of consequences of natural disasters. However, due to the lack of financial resources it was not possible to fully implement it. At present, the main challenges for effective implementation of preventive and mitigation measures are poor technical equipment for search and rescue services, poor management and poor professional qualification. Preventive measures are mostly implemented with the support of international financial institutions (the World Bank, Asian Development Bank).

Most monitoring works on hazardous



natural phenomena at the level are institutional implemented by:

State Geological Survey (landslides, karst phenomena, rock-falls);

The National Hydro-Meteorological Survey (heavy precipitation, hail and wind, draught, dust storms) glass ice, avalanches, debris flows and floods);

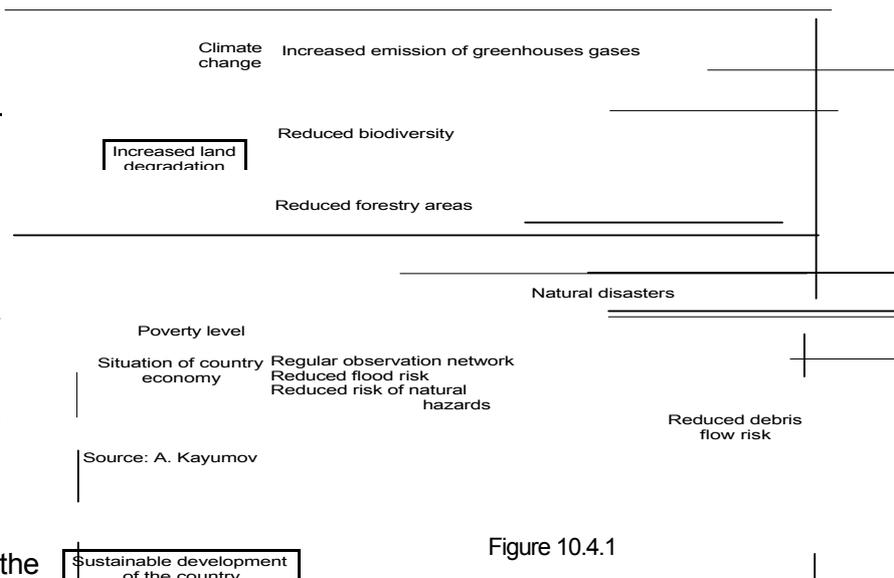
The Institutes of Geology and Institute of Earthquake Engineering and Seismology of the Academy of Sciences of the RT (they study reasons and causes of individual natural hazards: landslides, earthquakes).

The National Hydro-Meteorological Survey regularly publishes prediction data on possible unfavorable and dangerous hydro-meteorological phenomena and changes in river levels. Predicted and factual data is passed to respective agencies (local administration, the Ministry of Emergencies and others) which implement preventive, preparedness and mitigation measures. There are some uncertainties regarding the risk assessment of mudflows and floods caused by a lack of information in remote areas or by the improper operation of hydro-meteorological posts and stations, absence of methods and means of data processing and communication equipment.

#### 10.4.2. Priority needs and measures aimed at capacity building to mitigate natural disasters

Monitoring and prediction of dangerous hydro-meteorological and other processes, as well as development and realization of preventive and mitigation measures, has great significance for the implementation of the Conventions on climate change, combating desertification and biodiversity conservation.

There are Laws of the Republic of Tajikistan "On Civil Defense" (1996), and "On the Legal Regime of an Emergency



Source: A. Kayumov

Figure 10.4.1

Situation" (1999). The Government adopted Resolutions "On Evacuation Commission of the Republic of Tajikistan" (2002), "On the State Commission of the Republic of Tajikistan on Emergency Situations" (2002). There are acting Presidential Decrees and provisions of the Government of the RT on disaster prevention and mitigation measures. There is a draft Law of the Republic of Tajikistan "On Population Protection". This document will become the basis for population protection, loss assessment and liquidation of consequences of natural disasters.

Natural disasters are dangerous because of their rapid onset. However, their consequences can be prevented or considerably mitigated if necessary measures are taken, including adequate prediction and prompt information transfer, warning and evacuation of the population, and technical protection measures. To improve population preparedness and minimize possible negative impacts of climate catastrophes, it is necessary to conduct regular training with the involvement of the MoECD and to develop clear interaction mechanisms for local and national authorities, special services and population.

Primary needs in capacity building are



risk reduction and mitigation of natural disasters (figure 10.4.1) to decrease the vulnerability of the population, nature and the country's economy, reducing land degradation and ensuring biodiversity conservation.

Main technological requirements of the country aimed at the improved protection against, and mitigation of, natural disasters under the three Conventions are as follows:

- introduction and expansion of the network of automatic sensors measuring snow accumulation, air temperature, intensive precipitation and floods (sharp changes in river water level);
- improved prediction of natural disasters based on the advanced staff professionalism, introduction of highly-effective prediction methodology, computerized data processing and the use of satellite monitoring of high resolution;
- introduction of regional climate models for the assessment of draught and flood risks;
- introduction of radio-location meteorological equipment for identification of source areas of hail and intensive precipitation and their minimization;
- provision of anti-hail protective measures on the territory of 200-300 thousand hectares;
- creation and operational update of a database with the application of GIS technology with regard to mudflows, floods, landslides, avalanches, draughts, and other hazardous phenomena;
- introduction of modern communication means and warning systems in the areas most vulnerable to natural hazards;
- community training in disaster management; provision of training materials, audio-visual aids;
- planning and construction of protective structures in high risk zones;
- providing seismic stations with

modern equipment aimed at complex observations over the change of parameters most perceptible to upcoming earthquakes under geological conditions of the region;

- providing "Tsentrosipas" of the MoECD of the RT with the special equipment for search and rescue teams in vulnerable areas.

Since catastrophic mudflows and floods result in significant economic loss, make a considerable impact on land degradation in Tajikistan, and threaten people's lives and health, it is necessary to foresee the following measures:

Floods:

- 1 Preventive anti-flood measures:
  - regulation of river flows with the help of water-reservoirs;
  - construction of protective dams;
  - improved systems of storm collectors in populated areas;
  - drying out of wetlands;
  - relocation of the population to safer areas;
  - reforestation and forest planting works along river banks and at mountain slopes;
  - hydro-isolation of objects and infrastructure;
  - storage of emergency supplies, including food stuff and technical equipment in case of flooding.
- 2 Improved flood prediction and hydro-meteorological network efficiency upgrading, including automatic flood sensors.

Mudflows:

- prediction of debris flows and regular reconnaissance of mudflow prone areas;
- creation of slope-protection terraces;
- prohibiting deforestation of mountain slopes and ensuring regulated grazing;
- construction of hydro-technical protective structures (mudflow conduits, dams, and mudflow flumes).
- reforestation of mountain slopes.



## 10.5. PUBLIC INVOLVEMENT AND PARTICIPATION, PARTNERS<sup>1</sup> AWARENESS AND ENVIRONMENTAL EDUCATION

### 10.5.1. Situation review and capacity assessment

**Public Associations:** The recent period is characterized by a growing role of non-governmental sector at all levels. Significance of public participation in the solution of important problems related to environment and sustainable development is recognized today by researchers, governmental and non-governmental organizations.

At present, there are over 1,000 NGOs; of whom 47 actively operate in the environment field (please see the attached list). Some are involved in ecological education and training, others carry out nature-protective activities. Thanks to the efforts of non-governmental organizations, a significant improvement has been achieved in the sanitary condition of urban areas, forestation, and implementation of pilot projects.

Ratification of the Aarhus Convention on the access to ecological information opens new perspectives in the dialogue between the Government and public associations.

However, problems of climate change, desertification and biodiversity have not yet received due attention in NGO activity and therefore require measures fostering the involvement of these organization in the process.

The SANC process in Tajikistan should take place with the involvement of all stakeholders. In particular, more and more responsibility for the sustainable development of the society should be taken by NGOs. It is very important for NGOs to be involved at the early implementation stage, especially at the stage of decision-making process with regard to SANC.

The importance of inter-agency cooperation is highly appreciated by the Republic of Tajikistan and is reflected in official documents; however, their mechanisms of implementation still do not exist. Inter-agency cooperation should be aimed at the achievement of common goals through a joint integrated and mutually beneficial interaction. Realization of a wide

spectrum of interrelated services and capacity assessment is feasible only under the condition of a reasonable and adequate mechanism of interaction between the SANC and NGOs.

Unfortunately at present, our society does not have a clear understanding of the NGO role in the solution of environmental and important social problems. We live in a period of an early democracy and those who perceive the new NGO concept do not treat non-governmental sector with hostility.

NGOs have yet to be recognized as a full partner. Their latent capacity, mostly, the capacity of human resources, can compete with the government and business circles providing its own services, especially in environmental policy.

However, today public associations are suffocating without funds, without premises, equipment, communication means and other resources which impedes the development of partnership relations.

Main factors preventing from partnership development of the three sectors are as follows:

- the absence of, or non-compliance with, the legislation regulating different aspects of NGOs activity;
- regulations missing in the tax legislation that could promote NGO activity and charities on part of business organizations;
- stereotypes each sector has towards the other two (e.g. NGO activity is not professional enough, business people are egoistic, etc.).

Constraints of the NGO sector are as follows:

- unwillingness of partners to cooperate;
- NGO inactivity in partnership development;
- lack of information on other partners' interests, problems and priorities;
- lack of knowledge and experience in partnership building;



- lack of experience and skills in the protection of NGO rights and promotion of focus group interests;
- availability of legislative base combined with poor implementation mechanisms;
- NGO and Government distrust to each other;
- NGO isolation and unwillingness to share resources with other partners;
- poor NGO partnership relations;
- ambitious NGO leaders;
- artificial creation of quasi-NGOs by the governmental sector aimed at priority decision-making with regard to grants from international donors.

**Education and training:** The importance to make ecological education a high priority is supported by the fact that the progress of ecological education and training for the achievement of sustainable development has been discussed all over the world at the highest government level and by various international and multinational organizations for a number of years.

It is worth noting that the modern concept of education aimed at sustainable development is mostly based on ecological education agreements, such as the Belgrade Charter (UNESCO-UNEP, 1975), the Tbilisi Declaration (UNESCO-UNEP, 1977), the Salonika Declaration (UNESCO, 1977). The concept is also based on the "XXI Century Agenda" adopted by heads of states in 1992 at the UN Conference on Environment and Development and on many other documents.

The origin of environmental problems in general and in the context of the three Conventions in particular is mainly accounted for by socio-economic factors and their solution should be implemented not only through technical means but also through a change of the people's attitude towards climate, biodiversity and desertification. Therefore, ecological education of the population becomes more and more important for the ecological security and sustainable development of Tajikistan.

Ecological education and training is one of the fundamental bases for human lifestyle aimed at the achievement of sustainable country development.

Availability of education is guaranteed by the Constitution of the Republic of Tajikistan. In accordance with Article 41:

- everyone has the right to education;
- base education is compulsory for everyone;
- the state guarantees free base secondary and secondary professional education in governmental educational institutions and, according to capabilities and on a competitive basis, secondary professional and higher education;
- other forms of education are stipulated by Law.

The base Law "On Education", along with the "Concept of School Education" and other sub-laws, regulates public relations in this sector.

The Law of the Republic of Tajikistan "On Education" stipulates general educational structures, activities and management of the educational system of the Republic of Tajikistan and represents a legal base of other legislative acts published in compliance with the Law "On Education".

Management of the educational system of the Republic of Tajikistan is performed by both the government and the society and is carried out by authorized government bodies. The educational and training system includes: pre-school and out-of-school facilities, primary, base and secondary schools, lyceums, gymnasiums, professional-technical colleges as well as universities and other centers of post-qualifying education (advanced training), post-graduate studies and doctorate.

The country has a widely developed net of educational institutions; however, in some areas the poor capacity of a pedagogical cadre, the level of funding and the deteriorated material-technical base do not contribute to receiving adequate knowledge. There are over 3,350 secondary schools in the republic with 1.5 million pupils. Over



100,000 students study in 30 universities and 72 technical colleges.

There is also the Academy of Sciences of the Republic of Tajikistan, Academies of Agricultural and Pedagogical Sciences. Twenty five research institutions of the Academy of Sciences have over 750 specialists; among them there are 142 Doctors of Science and 275 Candidates of Science, 39 Academicians and 49 Corresponding Members of the Academy of Sciences of the RT.

In 1996, the Government developed and endorsed the "State Program of Ecological Education and Training of the Population of the Republic of Tajikistan for 2000 2010" (#93 issued on February 26, 1996).

This Program serves the base of the government policy in ecological education and is aimed at building an environmental mentality for its citizens, and their active social position as environmental protectors.

However, this document does not foresee the population awareness raising in the area of climate change, biodiversity and desertification. Mass media and the educational system do not pay sufficient attention to the problems covered by the three Conventions.

Effective implementation should be based on a number of new normative-legal acts for the promotion and improved awareness of the population in the area of climate change, biodiversity conservation and desertification with the involvement of the Ministry of Education, mass media, local administration and enterprises.

Mass media is an important method of raising public awareness in the environmental situation and the development of an ecological mentality in the population which also contributes to the implementation of SANC.

Print, radio and television are the main mass media in the republic. The country has 295 printed editions; 85 of them are regular, including 20 government print editions. Some of the editions cover environmental issues, for example, the ecological bulletin of the STare Committee on Environmental Protection and Forestry, the newspaper "Navruzi Vatan", information bulletins of non-governmental organizations. This capacity

should be actively used.

The growing NGO role provides opportunities for the involvement of the public to solve the most important environmental problems. However, despite the media coverage of environmental issues, the general country population has poor awareness of ecological problems, including climate change, land degradation and loss of biodiversity. This fact prevents the wide public from the active participation in the achievement of the final goal of all three Conventions.

The SANC process in Tajikistan included several assessment phases of public awareness with regard to the three Conventions. Interviews involved representatives of various country regions, people of different age and occupation.

The interview analysis showed that in general the population has a low awareness of the problems related to climate change, biodiversity loss and land degradation.

Reasons behind the low awareness are as follows:

- poor coverage of the three Conventions by mass media and public associations because the problem is quite new for Tajikistan;
- school and university curricula do not include subjects on climate change, biodiversity loss and desertification;
- mid-level officials (heads of khukumats, enterprises) have poor knowledge of the Conventions;
- insufficient number of popular brochures and books;
- Internet is not accessible to most of the population.

#### **10.5.2. Priority needs and measures aimed at capacity building for public involvement and participation, partners' awareness and environmental education**

Public awareness raising and the development of knowledge related to climate change, biodiversity conservation and combating desertification is very important for the improvement of the effectiveness of



implementation measures and elaboration of new directions of the state policy in this sphere.

Development and the implementation of measures aimed at raising public knowledge and awareness, improved public access to information, education of scientific, technical and management personal is one of the country commitments in the context of the Conventions on climate change, biodiversity conservation and combating desertification.

In perspective, it is also important to develop a respective program on the basis of an in-depth study of the country needs aimed at the improvement of the existing system of ecological education and public awareness in the context of the three Conventions.

**Public Associations:** Public associations, including youth and women associations of the Republic of Tajikistan advocate for the conservation of biological diversity and are concerned with the problems related to climate change and desertification / land degradation. These groups have specific knowledge on the respective issues of the three thematic areas and therefore should be involved in the preparation of SANC in Tajikistan.

Non-governmental ecological organizations play an important role in the formation of public opinion and ecological education, and have a specific capacity in the solution of environmental problems.

Key principles of partnership between NGOs and SANC Tajikistan :

- participation of all interested parties in finding ways to solve the existing problems;
- decentralized decision-making;
- search for feasible solutions;
- cooperation of potential rivals and opponents.

Ways to cooperation in the implementation of SANC Tajikistan:

- round tables;
- workshops;
- coordinating councils;
- public hearings;
- conferences.

In order to involve NGOs and raise the role of general public in the implementation of the SANC Tajikistan. it is necessary to:

- enhance legislation pertaining to public participation in the decision-making process, improve access to information and create implementation mechanisms for the SANC Tajikistan;
- promote conditions fostering NGO activities aimed at the involvement of citizens in the implementation of the SANC Tajikistan;
- promote, disseminate and explain principles and the idea of the SANC Tajikistan as well as its implementation mechanisms among all population groups of the republic;
- apply partnership mechanisms stipulated by the legislation of the Republic of Tajikistan and provide maximum NGO participation at all stages of the SANC implementation, especially in conducting an independent monitoring and evaluation;
- prepare methodological recommendations to advanced training programs for civil servants and decision-makers on the practice and procedures of public participation in the implementation of the SANC Tajikistan;
- establish the SANC Information Center;
- develop and conduct a series of educational and training programs on the SANC Tajikistan and its main principles for the wide public, decision-makers, parliamentarians, young people, non-governmental organizations, local authorities, workers, representatives of business and industry, academic and technical circles, farmers;
- foster the activity of civil structures and NGOs aimed at the expansion of social partnership for the solution of environmental problems;
- improve the system of information exchange between various sectors



(civil and public sector, business, mass media, etc.);

- provide an easy and free access of all population groups to government information, a wide use of modern communication means, including E-mail and Internet and an expanded volume of available information;

**Education and Training:** The framework of activities here should represent a complex of interrelated and mutually complimenting measures providing normative-legal, organizational, scientific-methodological and information development components of ecological education and training of the population of Tajikistan.

The key measures should be aimed at the formation of educational, informational and organizational conditions providing active participation of people in environmental protection and in the delicate use of natural resources.

It is advisable to disseminate the knowledge under the three Conventions on the basis of acting educational-training programs of mass media, khukumats and enterprises.

Among the information sources are the State Committee on Environmental Protection and Forestry, the Academy of Sciences, universities, line research institutes and respective centers, etc.

The Ministry of Education is developing training curricula used by educational institutions in the education process. Mass media is preparing and issuing training materials disseminated in print media, popular radio and TV programs. The Khukumat administration is conducting thematic workshops on climate change, biodiversity conservation and combating desertification.

The key factor in the implementation of measures aimed at the improvement of the educational system under the three Conventions is training and re-training school teachers and university professors. It

is also important to ensure that education curricula allocate sufficient hours to the problems of climate change, biodiversity conservation and combating desertification, including anthropogenic influence on environment, its impact on natural resources, economy and population.

Creation of required conditions for ecological education and community training should be based on joint and coordinated efforts of government agencies, nature protective, educational and other public associations, academic and cultural circles, mass media, entrepreneurs and all interested citizens.

Basic measures on the improvement of educational and training system in the context of SANC Tajikistan include:

1. Establishment of a system of continuing ecological education and community training through:

- development of training materials and organization of re-training and advanced training courses and workshops for teaching staff of higher and secondary educational institutions in the context of three Conventions;
- elaboration of a training curriculum for schools and universities aimed at the integration of issues related to the Conventions on climate change, biodiversity conservation and combating desertification.

2. Interaction of government agencies, public associations and population aimed at finding an effective solution of the problems of ecological education and training.

3. Development of a scientific-methodological system of ecological education and training.

4. Formation of a normative-legal base of ecological education and community training.

5. International cooperation in the sphere of ecological education and training.



## PART 4 PLAN OF ACTION ON CAPACITY BUILDING



### Summary of the analytical report on intersecting issues / problems

Important capacity-building tasks in the context of the three Conventions include five priority directions. It is necessary to point out that the capacity-building approach is conceived as the basis for identifying priority directions from the very beginning of the process. One of the criteria for priority identification was the requirement to determine goals common to all three Conventions and to ensure their synergetic merger in a single priority. Each of the five selected priority directions combines interests of not only the three Conventions, but also of the objectives of other national and international programs and projects. Synergy is found in the identification of effective means for promoting the combination of goals and capacities of all three Conventions to successfully implement tasks of the five priority directions, within the context of national capacity building for the protection of the global environment.

#### Rational use of water and power resources of the Republic:

The problem of rational use of water and power resources combines not only the goals and objectives of the three international Conventions, but also the interests of other economic sectors of the Republic, as well as those of other conventions. In Tajikistan, hydropower is a non-competitive energy source. Hydropower stations built on rivers flowing in deep mountain canyons not only take minimum space and are sources of inexpensive, ecologically pure energy, but also have a high water-regulating and irrigation value. Well-built hydropower facilities can perform anti-debris flow functions and considerably reduce the impact of natural hazards on the economy.

In the context of the international Convention on climate change, hydropower contributes to a considerable reduction of

greenhouse gas emissions, by replacing huge amounts of equivalent fossil fuel. In the context of Conventions on biodiversity and combating desertification, with the exception of a slight negative impact (possible flooding of rare animals' and plants' habitat, raising of the water table), hydropower facilities support irrigation of new lands, create breeding areas for new animal and plant species, and promote biodiversity conservation. Compared to the use of power from large rivers, capacity building under the three Conventions favors the use of small river power, as well as use of alternative power sources (e.g. solar, wind energy and bio-gas).

Calculations show that 1 kW of a new power source saves 6.52 tons of green biomass. This is equivalent to preservation of 1 ha of vegetation cover, protection of land from degradation and desertification, reduction of emissions by three tons, and an increase of the absorption capacity of earth's surface. This is another aspect of capacity building in the energy sector under the three Conventions.

Capacity building may be manifested through the creation and use of new energy sources, as well as the effective use of existing energy sources. Situation analysis shows that traditional use of energy-consuming appliances (such as bread ovens and heaters) have an efficiency of less than 10%. The use of power-saving technologies allows saving up to 40% of power, which is equivalent to the construction of a large power plant. Also of synergetic importance is an effective combination of locally available energy sources.

Reforestation and land management: In Tajikistan, the most important sector that can improve the living standard of the population and bring fast results is farm ing effective and rational land use because over 70% of the population are rural residents. Improved



lasoil conditions and productivity will make it possible to solve the poverty reduction problem in the Republic.

Capacity building in the context of reforestation and improved land management reflects the goals of all three Conventions on climate change, biodiversity conservation and combating desertification, as well as the objectives of many other programs and projects.

Reforestation, for example, means improved structure of forest cover; it strengthens anti-erosion qualities of soils, stabilizes the hydrological regime of mountain rivers, reduces mudflow risks, protects valuable resource and ornamental plants, and stimulates reduced emissions.

Improved land management and land productivity not only have a favorable impact on people's health and living standard, but also contribute to reduced emissions, biodiversity conservation and combating desertification. Cultivated and irrigated lands have much more green biomass. Over 50% of green biomass consists of carbon. If productivity of 1 ha of irrigated lands is doubled, carbon absorption will also double and 10 ha of slopes will be saved from pasture degradation.

Reforestation and land management fall under the authority of different ministries, institutions, organizations and individuals. A synergetic decision in this case could be the elaboration of a complex strategic plan for effective land management and coordination of all relevant parties. The Ministry of Transport should be contacted for the construction of roads, the Ministry of Energy for the construction of power plants, and other ministries and institutions for the use of land territories. They should act in coordination and achieve positive results in environmental protection with fewer costs.

In threatening situations, it is advisable to establish territories of preferential protection where the forestation and land management activities of all stakeholders could be coordinated by an authorized body.

Capacity building and effective resolution of forestation and land management problems depend on the society's recognition of their importance, active support and participation in their implementation.

#### Coordination of activities based on monitoring and information exchange:

Analysis of the activities implemented in Tajikistan in the context of three Conventions shows that ambiguities related to the inventory of emission sources and the release of greenhouse gases, registration of plant and animal species, and degree of land degradation arise from the lack of clear information. Complex monitoring and creation of a unified, centralized system of automatic data collection, processing and dissemination are considered priority tasks under all three Conventions.

The main task of monitoring activity is collection of objective information on the status of the environment at the national, district and local levels this is viewed as the only basis for adequate decision-making on environmental protection.

Capacity building during implementation of these tasks may be manifested in coordinating activities, avoiding overlap and focusing efforts on the solution of problems common to all three Conventions. There is no need to conduct three different monitoring activities to identify emission sources and absorption of greenhouse gases, or on land and biodiversity assessment. There can be one complex monitoring for all Conventions. On the one hand, such an approach allows implementation of the same volume of work with less effort and funding. On the other hand, this approach promotes receipt of full and reliable information on the status of the environment.

Today, there is practically no balanced registration system of land status. These tasks are implemented by only a few institutional structures, which have different purposes. There are not enough stationary control posts in the country. Similar is the situation with control over the population and status of flora and fauna. To successfully solve this problem to collect, process and disseminate this kind of information to all interested parties it is advisable to create a single monitoring and coordination center.

The most important parameters of a monitoring system are as follows: the rational distribution of complex monitoring stations that exercise control over land status, the population, and the status of flora and fauna, modification of climatic factors,



emission sources and the release of greenhouse gases throughout the country; equipping stations with instrumental systems and methods of operational control; and the creation of a relevant hierarchical system of data collection, storage, transfer, processing and analysis.

The Hydro-Meteorological Survey, which has a wide net of observation stations and posts all over the nation's territory, can serve as the basis for the establishment of such a center.

Disaster prevention and mitigation: In Tajikistan, natural disasters such as mudflows, floods, landslides, earthquakes and drought cause considerable economic and social damage. Although disasters are of a natural and not anthropogenic character, their consequences closely relate to the goals and objectives of the international Conventions on climate change, biodiversity conservation and combating desertification. Mudflows and landslides wash away the soil level, create ravines, accelerate land degradation and desertification, have a negative impact on the habitat and reduce the absorption capacity of land. According to the three Conventions, similar effects are caused by drought, storms and other natural hazards. During a short period of time, natural disasters cause such substantial damage to the economy that its rehabilitation requires a long time and a lot of funding. They destroy the normal living environment and create favorable conditions for the spread of infectious diseases and epidemics.

For example, regular mudflows in Varzob Gorge wash away communication networks and roads, contaminate drinking water and create epidemic threats. Capacity building can be manifested here in a search for effective prevention and means of mitigation. Construction of a few small, regulated anti-mudflow dams in the most prone areas (in particular, Khushiyori Gorge) would contribute to a considerable reduction of mudflow consequences. Reduced damage from natural hazards is closely connected to implementation of the abovementioned priorities. Reforestation fosters the water-saving capacity of slopes and reduces the risk of mudflows and landslides. Hydropower stations in

mountainous gorges carry out mudflow-protection functions. While enhancing land irrigation, they also help reduce impacts of droughts. Capacity building may also be reflected in the coordination of efforts of all ministries and institutions aimed at targeted, scientifically justified and effective measures. For example, instead of annually built bank-protection structures that are quickly washed away by floods (e.g. on the Yakhsu River), it is much better to build a stable protective structure that would take into account local landscape features.

Public involvement and participation: When people are empowered by ideas, they can become a strong force. Awareness and ecological education are the keys to attracting public attention to the problem of environmental protection and to the implementation of the three Conventions' goals.

In this sphere, capacity building may entail the community's recognition of the significance, necessity and effective methods of protecting the environment. It is not possible to separate ecological education from basic and professional education. Therefore, effective use of the Republic's existing network of basic and professional education can serve as the basis for the development of ecological education. This requires raising the quality of education both ecological and basic. The mass media (radio, TV, Internet, newspapers and magazines) provides definite possibilities in attracting the attention of the population and the general public to the issues of global environmental protection. In implementing this task, capacity building may entail a correct choice of materials, adequate use of methods and means of dissemination.

Community mobilization for implementing the ecological tasks and goals of the three Conventions could also be promoted by NGOs. In Tajikistan, there is a wide network of NGOs with various missions and objectives. Coordinated and targeted use of NGO potential in implementing the three Conventions will form a synergetic base in this direction.

Under the conditions of a market economy and low living standard of the population, economic factors play a decisive role in the formation of an appropriate



community attitude toward environmental problems. Market relations stimulate an intense use of natural resources, including poaching (the sale of unique plant and animal species, valuable minerals, etc.). The low living standard, lack of energy sources and construction materials, and their high cost make people cut down and use the green belt. The community in general, as well as each community member, must understand the economic and social benefits of environmental activity.

Thus, implementation problems in all priority areas are closely interrelated. In general, these problems are connected to many other difficulties of the country's economy, as well as to the resolution of various socio-economic tasks, the goals of other conventions and international agreements, programs and projects. Only a comprehensive consideration of all acting factors can help identify a realistic solution for the capacity-building problem and promote the sustainable development of Tajik society.

## **11.1. BARRIERS AND CONSTRAINTS WITH REGARD TO COMMON PRIORITIES INHERENT IN THE THREE CONVENTIONS**

### **11.1.1. Effective power and water resource management**

Eighty percent (80%) of the Amudaria River's flow, which provides water to the Aral Sea Basin, is generated in the territory of Tajikistan. Vulnerability assessment in the context of climate change for the mid-term perspective shows a decrease of Tajik water resources within the Vakhsh, Kafirnigan, Kyzylsu, Zeravshan and other rivers' basins. In some areas these trends may take a catastrophic form. The ongoing process of glacial degradation will aggravate the water resource crisis and will have an impact on irrigated agriculture. On the other hand, violations of water consumption norms results in the clogging of water reservoirs, devastation of channels and collector-drainage networks, changes in the water table and its poor quality all these lead to a deterioration of biodiversity and land degradation (salting and swamping).

For all three Conventions, the main constraint is in the reduced network of hydro-meteorological observations. Previously, hydrological observations were carried out by 11 stations and 138 posts, followed by hydrological predictions and publication of hydrological year books. Now the number of posts has been reduced to 89 and measurement parameters do not exceed oneortwo.

Other constraints upon effective water and power resource management consist in the absence of payment for irrigational water and a lack of concessions and economic

incentives that could stimulate water and power savings in industry, agriculture and the communal sector. Besides, there is a lack of funds for rehabilitation and reconstruction of water-distribution water-supply systems.

With an annual energy yield of over 16 billion kW/h, the Republic of Tajikistan is constantly facing a power deficit. Moreover, the power deficit is highest in northern provinces, which are undergoing rapid industrial development. The existing structure of power consumption has a low economic capacity. During the last 10-15 years, industrial power consumption has fallen twice while domestic power consumption increased by five times. One of the reasons for reduced power consumption is a low electricity tariff for the population, a situation that is directly related to the high poverty level. Another problem is in the low payment rate.

This situation is aggravated by an electric power deficit in winter time, as well as by the lack of alternative, non-traditional sources of energy. This is also a constraint in the context of the three Conventions.

### **11.1.2. Rational reforestation and land use**

The situation analysis of the forestry and land use sector defines land degradation and deforestation as the main constraints.

The key factors behind these problems are: natural, anthropogenic and natural-anthropogenic. Of those, the most negative



impact is caused by anthropogenic factors, such as:

- irrational location of hydro-technical structures;
- irrational location of cultivated lands;
- ignorance of traditional and advanced methods of land management;
- irregular overgrazing;
- reclamation of steep slopes;
- violation of irrigational norms;
- deforestation.

Main reasons behind these factors are as follows:

- poor institutional and organizational control;
- power deficit;
- absence of alternative energy sources;
- low level of awareness;
- poverty;
- poor monitoring of land status and forestry.

Historical trends in agricultural production in Tajikistan do not always meet the requirements of up-to-date economic development. At present, pasture conditions are characterized by a progressive reduction in their grazing capacity due to anthropogenic factors. Ameliorative status of soil cover on the irrigated lands remains mostly unsatisfactory. This leads to intense desertification, which, in its turn, influences climate change and biodiversity conservation.

The potential capacities of nature are not used in a comprehensive manner.

One mechanism for combating degradation in Tajikistan is the provision of power. Areas receiving at least 40% of their fuel-energy and domestic power needs have a reduced impact on vulnerable natural resources.

Other constraints exist in the absence of economic instruments (incentives and benefits, taxes and fees), poor control on the part of authorized bodies resulting in severe predeation of natural resources by the

population (deforestation, extermination of flora and fauna) and irrational land use.

The government established an institutional structure responsible for the rational use and protection of the environment and its components, implementation of rehabilitation and surveys, as well as for a unified technical policy and scientific and technical progress. Some areas require a double control carried out by relevant ministries and institutions, which function as both a monitoring agency and users of natural resources. There is still a need for an elaboration of emission norms and normative documents on the conservation and use of biodiversity.

The lack of funds, as well as other reasons (lack of reagents and obsolete equipment), resulted in reduced scientific research. The number of scientific-research laboratories on soil contamination has fallen by 55%. In 1998, there were 21 laboratories left out of 38. No systematic research and no assessment of natural resources is conducted; therefore, no recommendations on their improvement are made. In addition, there is hardly any experience of information exchange at the local, national and international levels.

The main constraints here consist in the poor training of land management and forestry specialists and the low quality of existing special ecological training courses. Others include low wages and poor motivation of personnell in further training. Neither specialists nor the general public have access to information on the three Conventions because many agencies demand fees for the use of this information.

The lack of monitoring of land status and forests prevents further planning and adequate response to degradation processes.

More recently, one of the most powerful anthropogenic factors responsible for climate change, degradation of biodiversity and desertification is the destruction of unique environmentally protective mountain forests, shrubs and undergrowth. Although forests in Tajikistan fall under the first category, that is, they carry out environment and soil protection functions and their destruction is strictly prohibited.



Irregular destruction of green mass for fuel is taking a catastrophic form, especially in the areas of kolkhozes and sovkhoses. Restoration, forestation and other forest amelioration activity is very slow, if at all. Natural areas of preferential protection lack funding and technical equipment, and are not always capable of carrying out assigned tasks.

### **11.1.3. Coordinating activities at the cross-sector and institutional level based on monitoring and information exchange**

Lack of monitoring and a complex system of observation, assessment and prediction of the biosphere's status under the impact of natural and anthropogenic factors is a serious constraint for the implementation of the three Conventions.

Besides the National Hydro-Meteorological Survey, monitoring of other individual elements of the environment is carried out by a number of state institutions: the State Committee on Environmental Protection and Forestry, Ministry of Emergencies, Academy of Sciences, Ministry of Agriculture and Ministry of Energy. Cooperation among these agencies is poorly developed and poorly coordinated.

Many of the ministries, agencies and organizations possess information on various issues of desertification, biodiversity and climate change and keep it in their archives, making it inaccessible for wide use and creating one more constraint for the implementation of the three Conventions. It is also necessary to point out that many documents are unreasonably "classified" or "restricted," which creates additional problems in information accessibility.

The lack of objective information on biological, geo-chemical and geo-physical parameter changes in the natural environment at the national, regional and local levels prevents decision-making in the context of the three Conventions.

### **11.1.4. Disaster prevention and mitigation**

The most common natural disasters in Tajikistan are floods and debris flows formed

during the spring-summer period due to intense melting of snows and glaciers. In most cases, movement of glaciers is accompanied by the creation of temporary lakes with catastrophic consequences.

Due to the historically developed location of industrial enterprises and settlements, including wide territorial complexes, many agricultural and industrial structures are now prone to landslides, rock-falls and debris flows.

It is now well known that around 900 large and small settlements and structures are prone to natural hazards caused by industrial desertification. The complexity and diversity of engineering-geological conditions account for widespread technically induced desertification. These processes threaten 10-15% of the territory, and in the event of an earthquake up to 80%.

Besides the industrial pressure of road construction, considerable strain is created during the operation of mountain roads, resolution of traffic accidents and resumption of traffic. This is primarily caused by dangerous landslides, mudflows and avalanches, or by industrial pressure and erosion.

Usually, these events are of an emergency nature and require operation decisions without the elaboration of construction documents, to say nothing of environmental protection projects. In such cases, road cleaning creates double or even triple damage to a neighboring site, which soon becomes the reason for another hotbed of an emergency situation, only more destructive and more damaging.

In this sector, the main constraint is a lack of budget allocations for scientific research in the context of the three Conventions. Lack of funding required for the maintenance and equipment of stations, posts and observation points resulted in their partial closure and liquidation, which took an immediate toll on the quality of predictions and observation outcomes.

At present, the net of hydro-meteorological observations in Tajikistan includes 58 stations and 126 posts and observation points monitoring for environmental pollution. However, lack of



qualified personnel prevents normal operation of some of the existing stations and posts.

Obsolete stations' and posts' equipment, and problems with its upgrade may very soon result in the reduced quality and reliability of data. This will have an impact on the quality of climatic information, including weather forecasts and river flow, floods and other hazardous natural phenomena. All this represents one more constraint for the implementation of the three Conventions.

#### **11.1.5. Public involvement and participation, partners' awareness, and environmental education**

Public involvement in the resolution of environmental problems is not feasible without effectively operational non-governmental organizations. At the same time, the fast movement of the rural population into the cities, reduced living standard and long economic crisis resulted in decreased social activity of a population concerned with issues of short-term survival. This creates barriers for community involvement by governmental and non-governmental organizations.

The main constraint here is a low community awareness of the problems covered by the three Conventions.

NGOs operating in the SANC area do not coordinate their activity. They stay away from each other, are afraid of competition and avoid transparency. The activity of public associations very much depends on the interests of donor programs and large inter-regional institutions. However, public environmental organizations share a sustainable trend and act according to their capacity, resources and mission.

There is practically no database on ecological NGOs, no information on their location, addresses and contact persons. This is another constraint in the creation of partnership relations and public involvement in the context of the three Conventions.

(Dates don't make sense here, same year) In 1997-1997, ecological NGOs tended to unite their forces. At that time they established the first national Public Council for the purpose of information exchange and

coordination of activities. However, due to the absence of a recognized leader or for other reasons, this trend eventually grew weak. At present, the Public Ecological Council of the RT has broken up and disappeared.

After gaining independence, Tajikistan created a significant legal base for the activity of non-governmental organizations and the development of social partnership. The country joined the Aarhus Convention "On access to the information, public participation in decision-making and access to justice on environmental issues" which expands public opportunities for participation in the government decision-making process. However, the lack of adequate mechanisms to implement many adopted laws and conventions, including the Aarhus Convention, prevents wide public participation in decision-making and represents one more constraint.

The Law "On Nature Protection" includes such Articles as:

- Article 13: The right of citizens to making environmentally important decisions and exercise control over their implementation;
- Article 37: Public environmental expertise;
- Article 68: Public environmental control;
- Section XI: Community participation in environmental protection;
- Article 69: Forms of community participation in environmental protection.

However, the implementation mechanism of these articles has not been developed and the community is not involved in the environmental protection process in any practical way.

The law of the Republic of Tajikistan "On Environmental Expertise" adopted in 2003 considered amendments introduced by public ecological organizations. These mostly related to the rights and duties of public ecological organizations in the implementation of public environmental expertise and covered other equally important issues. This is a positive example of an active collaboration of governmental



and non-governmental structures in decision-making based on stakeholders' interests. On the other hand, environmental expertise has not yet become a real force. One reason for this is that it is performed according to the law of the Republic of Tajikistan "On Environmental Expertise" (Article 31) at the expense of public associations, while the state expertise (Article 30) is performed at the expense of a client.

#### Awareness and education

Another very important factor in the implementation of the three Conventions is the level of the government's and public's awareness and understanding of the thematic areas.

The operational sphere of ecological NGOs is rather wide and is aimed at training events, workshops, child and youth education, information dissemination, expertise, environmental actions and lobbying. There exists an informal NGO network on program development and implementation of local projects on environmental protection (LNEAP), combating desertification, ecological education, and collaboration with schools and communities. However, it is next to impossible to receive reliable information about the implemented and ongoing projects on the Conventions' thematic areas.

Despite a high number of registered print media organizations, ecological and environmental protection issues, especially the problems covered by the three Conventions, are not adequately covered. This is hampering public participation in the implementation of the three Conventions, as well as access to reliable information. Another constraint is limited access to the Internet, which restrains the timely dissemination of international data among interested governmental organizations and social groups.

In the globalization context of international political and economic relations, informational support of decision-

makers becomes a strategic factor in the sustainable development of any country. Sustainable development becomes problematic because of a lack of clear information policy in the sphere of ecological education and training.

In order to implement the law of the Republic of Tajikistan "On Nature Protection" and the "State Program of Ecological Education and Training," the government developed a number of activities aimed at the ecological education of the population. From 2002-2003, the school curriculum includes a special course in ecology for the eighth-grade students; special courses have also been introduced in some of the nation's universities. School textbooks on "Ecology" and "Ecology and Economy" have been published. The level of knowledge of school graduates does not meet contemporary requirements. Among the reasons of poor professional knowledge is the low level of school education, lack of methodological literature, including literature in the Tajik language. The lack of language competence does not allow for learning or adoption of foreign and international experience. These factors can also be viewed as constraints.

Among print media outlets, there are ecological bulletins and the newspaper "Navruzī Vatan," published by the State Committee on Environmental Protection and Forestry. Radio and television broadcasters have organized a cycle of special programs, such as "We and Nature," "Animal Kingdom," children's TV competitions on environmental themes. Other TV programs include a round table, a series of scientific conferences for young researchers, teachers and university students, as well as more than 30 drawing competitions and quizzes devoted to nature protection for pre-school and school-age children. There is a monthly socio-ecological bulletin "Tabiat;" however its circulation is relatively small and the bulletin is not available for the wider public. The bulletin is displayed on the Internet, which, unfortunately, also has limited access.





## Overcoming barriers and removing constraints in capacity building

### 12.1. GENERAL POSSIBILITIES

The analysis of constraints indicates the priority tasks within each of the three Conventions and the common steps that should be taken to overcome and eliminate these constraints.

First of all, an effort must be made to improve the system of legislation and normative acts regulating the use of natural resources and to ensure their compliance with the key principles and requirements of the global environmental Conventions. It is necessary to strengthen the laws applied to the ecological security of economic resources and stipulate the benefits and economic mechanisms that result from the rational use of natural resources and reduced emissions.

Elimination of financial barriers in the context of the three Conventions can be achieved by *joining the Kyoto Protocol to the Framework UN Convention on Climate Change*.

There are no quantitative commitments on reduced emissions for developing countries, including Tajikistan. The Kyoto Protocol outlines three important mechanisms for complying with the Framework Convention: (1) joint implementation; (2) trade of emissions; and (3) the Mechanism of Clean Development.

According to the Kyoto Protocol's Mechanism of Clean Development (MCD), parties not included in Annex 1, including the Republic of Tajikistan, enjoy benefits of project activities that result in certified, reduced emissions. Developed countries, to comply with their quantitative commitments, provide financial, technical and other assistance for the implementation of projects by parties excluded from Annex 1 of the Framework UN Convention on Climate Change as it relates to reducing emissions or improving their natural absorbents. MCD activity may be realized on the condition that all project partners are parties to the Kyoto Protocol. For Tajikistan, the MCD is one of

the main sources of financial and technological assistance for implementing activities to reduce emissions and to improve natural carbon absorbents identified in all three Conventions.

Compliance of national legislation with the program documents (PRSP), in accordance with commitments under the three Conventions:

If the nation's legislation, especially the program documents, does not reflect the commitments, actors, financial and regulating mechanisms covered by the Global Environmental Conventions, there is no way to discuss their implementation or a long-term perspective.

Involvement of donor countries and international organizations in the implementation of NAP projects:

At the present stage, international assistance is vital for developing countries, including Tajikistan. Considering the development challenges faced by Tajikistan as a country, with a transitioning economy and unsolved problems, it is necessary to expand the range of international organizations that provide support for implementing the goals and objectives of the three Conventions. International support is required for the: (i) creation of a national environmental network and conservation of endangered species; (ii) development of new natural management schemes for the areas of preferential protection; (iii) elaboration of economic regulation mechanisms; (iv) organization of specialized monitoring and biodiversity inventory; (v) promotion of informational and educational activities; (vi) improvement of the legislative and institutional base for environmental protection; (vii) introduction of new technologies and advanced management.

Establishment of biosphere reserves in Tajikistan and their inclusion in continued green corridors also require international



cooperation and support.

International assistance is also very important for development of the SANC. Allocation of funds for priority activities, avoiding overlap and attracting new donors will promote greater success in overcoming the existing constraints.

Establishment of a single coordination center for the implementation of environmental protection Conventions:

Considering the importance of elaborating a unified program of action under the three Conventions, continued coordination, clarification of priorities, identification of new possibilities and the development of recommendations for priority funding, it is necessary to have a well-balanced system. The center will serve as a link between the three Conventions. It will promote project design and development, revision and monitoring. In addition, the center will inform the government and other interested parties on priority projects and will supervise the integration of convention issues in program documents and the laws of the Republic of Tajikistan.

Incorporation of projects into the State Investment Program:

In view of limited budget resources allocated for environmental protection, as well as difficulties in attracting investments for implementing the three Conventions, it is necessary to utilize the potential of the State Investment Program along with the participation of international donors. Since the key trend of this program is assistance for the social sector, the infrastructure and development of economic reforms and their outcomes are directly linked to the Poverty Reduction Strategy Paper. This document reflects measures for the rehabilitation of irrigation systems, training for agricultural producers in the use of mineral fertilizers and agricultural chemicals, development of national power- and water-saving programs and, under the section of "Environment and Tourism," implementation of pilot projects under the three Conventions, including the development of alternative energy sources in rural areas. It is necessary to point out that these measures have already been reflected, but not properly elaborated.

## **12.2. WAYS TO OVERCOME CONSTRAINTS IN PRIORITY AREAS UNDER THE THREE CONVENTIONS**

### **12.2.1. Effective power and water resources management**

Within the present production and demand situation, Tajikistan will systematically suffer from a power deficit that could be resolved by an increased domestic output. If this happens, the desertification process will definitely decrease. Electric power production, taken alone, will reduce annual land erosion by 0.8-1.1 ha because deforestation will also be reduced. The use of renewable energy sources instead of wood, coal and oil-fuel, that sustainable supply of ecologically clean power sources could solve a number of social and environmental problems in rural areas.

Increased efficiency of available power resources, including the development of mini-hydro facilities, will help reduce deforestation, conserve biodiversity and improve the status of land resources.

The establishment of a scientific-production center on the development, production and dissemination of renewable energy appliances will make it possible to cover the power deficit, prevent mass deforestation and reduce emissions of greenhouse gases.

Introduction of irrigated water tariffs will increase the responsibilities of water-economy participants in the rational use of water and watersaving efforts.

Restoration of the observation system based on a network of optimal posts and stations, along with updated technical equipment and means of communication will make it possible to overcome information barriers and promote elaboration of long- and mid-term predictions about water resources. This, in its turn, will reduce the damage from natural hazards and land degradation.



### **12.2.2. Rational reforestation and land use**

Now, with the organization of dekhkan farms, the law "On Nature Protection" is missing requirements and objectives of the listed legislation and normative acts. Considering the situation and the appearance of new requirements in the area of rational use and protection of lands, it is important to amend the law "On Nature Protection" and other normative-legal acts.

It is necessary to introduce the following penalties in the Administrative Code:

- for public, farms' and private ranging of pasture bounds;
- for ranging in public areas (gardens, avenues, lawns, squares and alleys);
- on legal and physical persons for the contamination of soils (lands) with solid domestic waste;
- on legal and physical persons for the absence of crop and pasture rotation resulting in soil and pasture degradation.

There is a single normative instrument regulating identification of damage caused by the violation of land legislation. It also needs improvement, especially for the identification of economic loss for:

- pasture degradation;
- violation of pasture rotation norms;
- violation of crop rotation norms;
- violation of the requirements to public, farms' and private ranging;
- violation of the requirements for the use of steep slopes.

In addition, land protection and land rehabilitation require adoption of the following legislative-normative acts:

- identification of ecological tax for land use;
- adoption of a decision regulating the use of steep slopes for irrigation of cereals and legumes;
- development of a new economic instrument for private grazing;
- on soil status research relating to its contamination.

Despite limited funding, the state budget allocates money for natural reserves, zakazniks, national parks, nature protection areas, institutes of the Academy of Sciences (Institutes of Botany, Zoology and Parasitology, Plant Physiology and Genetics), expert training, forestry protection and a number of other institutions involved in biodiversity conservation and restoration. In view of the high significance of biological resources and their role in poverty reduction, implementation of the NAP envisages an increase in budget allocations and financial assistance to NCB. The fundamental significance of biological resources for economic and social development should be defined at the expense of re-allocated funds aimed at biodiversity conservation and similar activities.

Key elements in overcoming economic constraints is the provision of tax benefits and the introduction of special taxes (fees) for production processes connected with biodiversity (imposition of taxes on investments for construction on protected areas, protected roads, transmission lines, etc.). Other measures could include the introduction of a mechanism of obligatory ecological insurance for environmentally dangerous technologies, use of soft loans aimed at biodiversity conservation (with the banking interest guaranteed by an environmental fund), quoting of side products collected in nature ecosystems in the amount of at least 5% from the cost of similar products received in the economic sector, The introduction of entry fees for access to protected areas (visit and transit), parking in specially allotted places, etc.

Implementing activities for rational land use, adequate location of structures, and specialization in farm production involving the use of agricultural lands is now one of the most important tasks for overcoming the nation's constraints. This solution requires the development of zonal agricultural systems. These are based on micro-zoning in accordance with natural and economic conditions.

Other measures should include monitoring of agro-biodiversity in mountain areas which will promote a harmony between economic activity, biodiversity conservation and its sustainable use. This will also create



conditions for the control of surface and soil biodiversity, and help develop mapping materials on micro agro-biological zoning of areas occupied by agro-ecosystems.

Forest fires bring a lot of damage to forestry. This environmental loss is estimated at tens of millions of Somoni. In accordance with regulations, this requires the improved protection of forests against fires, procurement of equipment, including fire observation towers, development of anti-fire road networks and updated means of communication, fire extinguishing and transport.

During recent years, numerous insect and disease hotbeds have been recorded. To increase protection, it is necessary to continue research on biological protection of forests against insects and diseases, with the application of both chemical and biological means.

Therefore, Tajikistan needs to develop and present for the endorsement of government a "Concept on the development of a network of nature protective areas of the Republic of Tajikistan" that would foresee the expanded protection of unique natural entities, including the assignment of a natural reserve status to some of the zakazniks. At present, this status has been granted to 162 areas, such as the natural boundary Archa Mairon, Kuli Varsaut, Childuhtaron, forest gardens in the flood plain of the Sardai Miyona River, the riparian forest of the Obisurkh and Vanch flood plains, saline domes of Khodja Mumin and Khodja Sartez, the rock Chirak-Tash, the "Burning Mines," and others.

Activities providing restoration of the country's forestry include: Provision of imported fuel to the population, maximum provision of gas and electricity supply, increased fines for forest damage, especially relating to decision-makers; prohibition and exceptional limitation of grazing in broad-leaved and juniper forests, and open dry forests; optimization and regulation of grazing in desert and riparian forests; establishment of reservation conditions; prohibition of planned deforestation except for sanitary reasons and under the control of authorized environmental protection agencies.

It is obvious that a special program should be developed, based on the interests of the three Conventions, which will determine priority projects and allocation of resources.

### **12.2.3. Coordinating activities at the cross-sector and institutional level based on monitoring and information exchange**

The country has sufficient capacity for the organization of optimal use of natural resources, taking into account soil and climatic conditions. There is a network of stations exercising control over various natural processes from seismic activity to the composition and status of vegetation.

The territory of Tajikistan is covered by hydro-meteorological stations exercising control over atmospheric air, water resources, weather conditions, soil and climate both in the natural and cultural environments.

Each agro-climatic area has agro-chemical laboratories monitoring plant diseases, as well as the status of the soil cover.

Some soil-climatic and geo-botanic zones have botanical stations monitoring the condition of natural vegetation cover, and the dynamics of its seasonal and successive development.

There are also a number of forestry experimental stations, sites and nurseries, all of which monitor the status of the country's forests.

More complex and fundamental study is carried out by natural reserves, zakazniks, natural parks and game husbandry areas.

Besides these stations, ministries and agencies organized experimental plots allocated for gardens and vinery, control over water resources, anti-plague and veterinarian stations, etc. Capacity-building potential consists in equipping these structures with modern appliances, staff and respective funding, which will allow resumption of work on a full scale.

Considering the lack of funds, it is necessary to identify the list of priorities that would exercise control over the natural



environment in the most important areas with regard to the requirements of the three Conventions. This work can be carried out by the Hydro-Meteorological Survey.

Research and coordination activities should include:

- annual record of degraded lands, their development assessment and urgent measures against erosion processes, salinization of surface and underground waters, etc.;
- full record of the dynamics of desertification areas, with the use of satellite imagery;
- monitoring different categories of land degradation;
- creation of a database and information centers for the collection and analysis of data on different categories of degraded lands;
- implementation and stimulation of studies for accurate identification of territories and areas of degraded lands;
- promotion of information exchange on the rational use of soil resources;
- development of norms for different categories of eroded and washed-off soil;
- promoting restoration of research by scientific-research institutions at their experimental plots to develop criteria for eroded and degraded lands;
- creation of working groups consisting of representatives of scientific-research and design institutions of each region is an indispensable condition for implementing measures for biodiversity conservation, combating degradation and mitigation of climate change.

#### **12.2.4. Disaster prevention and mitigation**

Rational localization of observation stations in the republic, equipping them with appliances and methodologies of operational control, and the creation of a

unified system of data collection, storage, processing and analysis will help overcome these constraints and coordinate activities in the most vulnerable places.

Consequences of natural disasters can be prevented or significantly mitigated if necessary, preventive measures are taken, such as adequate prediction and fast information transfer, community warning and evacuation, and provision of means of technical protection.

It is therefore important to:

- conduct staff and community training;
- ensure public participation in education campaigns;
- strengthen control of authorized agencies and government structures over localization of economic structures in vulnerable areas.

The entire road system should be modeled and tested electronically in different operation regimes and with the account of industrial and automatic pressures.

The design of economic structures requires, first of all, elaboration of normative-technical documentation to protect the selected site from desertification. Site selection for the construction of economic structures should be preceded by an evaluation of their environmental capacity.

In mountainous areas, where industrial pressure is more rapid, the impact of destruction is thousands of times higher than in the plains. It is important to have not only a system of continuous monitoring, but also an early warning system identifying risks for each specific site. Only these measures can ensure that that constraints in the context of the three Conventions can be overcome.

#### **12.2.5. Public involvement and participation, partners' awareness, and environmental education**

One way to increase public participation is by supporting public activity, organizing and convening seminars, round tables, disputes and raising public awareness of the problems addressed in the three Conventions.

Therefore, to overcome constraints, it is



necessary to involve the wider public in implementing commitments under the three Conventions through organization of workshops for representatives of khukumats, djamoats and NGOs, training of trainers for the implementation of the NAP on the three Conventions, publication of visually informative literature in the form of booklets, brochures and leaflets to attract people's attention to combating desertification, biodiversity conservation and climate change. It is also necessary to use mass media to report the problems of climate change, combating desertification and the conservation of ecosystems, and to help form an ecological mentality among the local population through discussions, press conferences and meetings.

An improved role of local government, the community and various public associations in decision-making and resolution of the three Conventions' problems does not require much funding, yet makes it possible to reduce environmental pressures and satisfy people's needs for foodstuffs. In this regard, public awareness of combating desertification and the necessity to preserve and protect natural resources (land, vegetation, water, etc.) is one of the main strategic directions and trends for capacity building to achieve sustainable development in all branches of the economy.

All three Conventions envisage participation of the wider public in their implementation, as well as "effective participation at the local, national and regional levels of NGOs and local communities both women and men." Unfortunately, the key strategic actors happen to be government agencies exercising control and funding functions, and urban NGOs that have little contact with rural residents. It is, however, exactly the local population that is intensively using natural resources and, at the same time, not involved in combating desertification and biodiversity conservation. Much work needs to be done in the private agricultural sector collective and dekhkan farms which often ignore regulations for the rational use of natural resources due to poor awareness and education; this presents a potential risk for increased desertification and biodiversity loss.

Modern global information-communication technologies of the Internet should play an important role in public awareness. The main need for information support in the spheres of ecology, environmental protection, demography, gender policy and others is the creation of a database that could assist governmental and non-governmental structures in making effective decisions for the achievement of the most positive results.





## Budget estimate and funding sources

Although main funding should be provided by the state and private sector budgets of the republic, Tajikistan lacks resources and technologies required to solve its key development problems as well as such global problems as climate change, biodiversity conservation, combating desertification and, naturally, SANC. General conditions of the NAP implementation are stimulating economic growth, and social development and poverty alleviation. During the last years, the country has gone through a period of macroeconomic stabilization; however, the budget deficit is still high, as is the external government debt.

Implementation of the National Capacity Building Action Plan (NCBAP) The NCBAP cost estimate is \$20 million. Funding sources include owned funds, as well as national and local ecological reserves. There is also a need for international donor support. Responsibility for the implementation of the NCBAP lies with the SANC Center of Tajikistan.

The NCBAP funding will be partially covered by the country itself. However, numerous measures will require exploration of other possibilities and funding sources. This will promote the procurement of different funding sources and help the NCBAP become a free standing process based on a well-developed plan and the NAPs of the three Conventions.

Following is a tentative list of financial mechanisms for the NCBAP implementation

Special nature protection funds: These may become an important means of biodiversity conservation funded from internal sources.

Local budgets: Local implementation will allow using reserves of local special nature protection funds.

Micro-crediting: Development of micro-crediting will make it possible to fund small-scale operations.

Small grants: These are especially effective at the initial stage and are ways to build local capacities in nature protection.

Global Environmental Facility: SANC is one of the main GEF objectives of global importance. It provides an opportunity to implement large-scale projects based on a number of funding mechanisms (including grant programs of small and medium size).

Donor-funded projects: Considering the wide spectrum and efficiency of the NCBAP activities, including social and economic issues, problems of rural development and biodiversity conservation, combating desertification, and climate change, there are various possibilities for local and foreign donor cooperation in project development, as well as in:

- MCD of the Kyoto Protocol;
- quotas sale;
- use of other potential programs and projects.

The NCBAP funding:

In order to maintain the general level of the environment, nature protection expenditures should consist of 6-7% of the GDP (gross domestic product). According to the UN norms for developing countries, capital investments in environmental protection must be around 0.8% of GDP.

In 2000, funds allocated for environmental protection measures constituted 0.07% of the GDP. During the previous five years (1995-2000), on average, these expenditures constituted 0.034%.

The total amount of funding required for the implementation of the Capacity Building Action Plan in the next ten years is tentatively \$20 million, with annual expenses of \$2 million. The NAP on climate change costs \$500 million; on biodiversity - \$27 million; and on desertification - \$400-600 million.

The share of the state budget will constitute 10% (targeted funding of environmental protection measures in



various sectors). Reserves of ecological funds will make up another 10%. Part of the required funding (up to 35%) will be donated by other users of natural resources and economy objects (land-users, forestry, NGOs, etc.) during the implementation of sustainable development programs in various sectors with the support of international loans and grants. Additional support from international financial institutions and foreign donors will amount to 40-45%.

Environmental expenses could be minimized by the improvement of production

technologies, rational use of natural resources and development of economic incentives.

The NCBAP implementation plans to increase domestic funding sources, including the use of funds stipulated by the Law "On Nature Protection" that are not properly used.

Economic instruments should provide economic activities to create conditions that stimulate the rational use of natural resources, especially within the context of the three Conventions.





## Monitoring and evaluation

Monitoring and evaluation define the efficiency of the planned measures, help avoid overlap, use the best practices and adapt the plan to the changing environmental and economic situation. The results serve the basis for the efficient analysis of systems and measures, and for decision-making on priority actions within the context of the three Conventions. Evaluation will compare achieved results with initial goals and objectives of the project or activity. Evaluation of the NCBAP's efficiency will be based on the comparison of achieved results to the goals.

Following are the main monitoring objectives:

- present a picture of trends and aggregated effects of the planned measures;
- register changes in priority directions and signal early warning;
- create public understanding and raise awareness of the population;
- create conditions for experience exchange and harmonization of priority activities;
- provide information for decision-making, development and implementation of the law, strategies, and policies;
- exercise control over the implementation of the NCBAP objectives.

Monitoring and evaluation process:

The NCBAP will be based on existing structures and available information.

Monitoring will be performed as follows:

- agencies responsible for implementation will monitor and evaluate progress of specific activities and evaluate results in accordance with the NCBAP;

- executive committee together with the SANC Center will bear responsibility for gathering and analyzing information on the plan's implementation from various ministries and participating agencies;
- monitoring and evaluation results will be disseminated during informational and public awareness raising campaigns.

Reporting requirements:

The NCBAP's progress implementation reports will be provided systematically, will correspond to their purpose and will be user-oriented.

Types of reports:

- annual national progress implementation report. The report will include detailed descriptions of measures and their respective results;
- the report is meant for decision-makers, donors, NGOs, academicians and business circles;
- public progress implementation report. This is a brief review of the national report on project implementation for the general public;
- interim progress implementation report. By the end of each five-year period, the NAP implementation will be analyzed. The report will include analysis of best practices and failures during the course of the project's implementation, as well as recommendations for the next phase.

Monitoring and evaluation challenges:

- unwillingness to share information with other organizations;
- poor quality of data, considerable deficiencies and lack of required data;
- poor analysis and synthesis of data



for policy decisions;

- unwillingness of the Government and private sector to reveal information to the wide public;
- irrational use of limited resources allocated for monitoring; overlapping functions of different agencies.

#### The NCBAP Project Management

The direct NCBAP implementation will be performed by a wide range of organizations and agencies. Considerable part in the NCBAP implementation will be played by the

SANC Center, the State Committee on Environmental protection and Forestry, the State land Management Committee, khukumats, NBC and CEC. The SANC Executive Committee, with its information access and management skills, is independent enough to conduct objective evaluation and conduct independent monitoring. The Project Manager and the SANC Center will interact with key implementation partners, create a structure and identify the composition of executive bodies.



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## ABBREVIATIONS, CONVENTIONAL SIGNS, MEASUREMENT UNITS

### Abbreviations:

ADB	Asian Development Bank
AS	Academy of Sciences of the Republic of Tajikistan
SC	Stock company
BD	Biological diversity
WB	The World Bank
GDP	Gross Domestic Product
WMO	World Meteorological Organization
WHO	World Health Organization
IR	Internal reserves
OBF	Out of the budget funds
HEI	Higher educational institution
SB	State budget
GBAO	Gorno-Badakhshan Autonomous Oblast
HMS	State Hydro-Meteorological Survey
GIS	Geographic Information System
SC	State company
SCEPF	State Committee on Environmental Protection and Forestry of the RT
SSC	State Statistics Committee of the RT
SFR	State Forestry Reserve
GMO	Genetically modified organism
MPIW	Mining and processing integrated works
SLMC	State Land Management Committee of the RT
GCMS	Global climate monitoring system
CDGM	Chief Department of Geodesy and Mapping
SGS	State Geological Survey
HPS	Hydropower station
GEF	Global Environmental Facility
IZP	Institute of Zoology and Parasitology named after Y. N. Pavlovsky
CBD	Convention on biological diversity
UNCCD	UN Convention on combating desertification
PI	Performance index
IG	International grants
IAEGCC	Inter-Agency Expert Group on climate change created by the WMO and UNEP in 1988
MFA	Ministry of Foreign Affairs
MIWM	Ministry of Irrigation and Water Management
MH	Ministry of Health
MI	Ministry of Industry
MA	Ministry of Agriculture
MT	Ministry of Transport
MF	Ministry of Finance
MET	Ministry of Economy and Trade
ME	Ministry of Energy
MJ	Ministry of Justice
MED	Ministry of Education
IPI	International projects and investments
LF	Local funds
UNEP	International union of environmental protection
IFM	International financial mechanisms
MK	Local khukumats
MCD	Mechanism of Clean Development
MOECD	Ministry of Emergencies and Civil Defense
SRI	Scientific-Research Institutes



SRIF	Scientific-Research Institute of Forestry
NPC	National Project Coordinator
NCSD	National Commission on Sustainable Development
NAP	National Action Plan
NEAP	National Environmental Action Plan
NGO	Non-governmental organization
NSAPBD	National Strategy and Action Plan on biodiversity conservation
NCB	National Center of biological diversity and biological security
EIA	Environmental Impact Assessment
UN	United Nations
APP	Areas of preferential protection
GG	Greenhouse gases
PLP	Permissible level of pollution
PM	Project Manager
APOS	Air pollution observation station
IA	Industrial organization / association
UNDP	United Nations Development Program
RAS	Russian Academy of Sciences
UNFCCC	UN Framework Convention on Climate Change
RRS	Regions of Republican Subordination
RT	Republic of Tajikistan
NHMP	Natural hydro-meteorological phenomena
MM	Mass media
CIS	Commonwealth of Independent States
SANC	Self-assessment of the national capacity-building on global environmental management
JV	Joint venture
OF	Owned funds
USA	United States of America
TADAZ	Tajik aluminum factory
TAAS	Tajik Academy of Agricultural Sciences
TAU	Tajik Agrarian University
TSMU	Tajik State Medical University
TSNU	Tajik State National University
TCBRI	Tajik Cattle Breeding Research Institute
TS	Thermal station
FAO	Food Agricultural Organization
WWF	World Wildlife Fund
CCS	Center of Strategic Studies
PI	Private investment

**Measurement units:**

°C	Celsius temperature
g	Gram
ha	Hectare
J	Joule
cal	Calorie
kW/h	kilowatt/hour
kW/h / m <sup>2</sup>	Kilowatt/hour per square meter = 3,6 MJ/m <sup>2</sup>
kg	Kilogram
Kcal	Kilo joule
m a.s.l.	Kilo calorie
	Kilometer
	Meter

Elevation above sea level



m/sec	Meter per second
m <sup>2</sup>	Square meter
m <sup>3</sup>	Cubic meter
m <sup>3</sup> /sec	Cubic meter per second
MW	Megawatt = 1000 000 watt
mln	Million
bin	Billion
mm	Millimeter
sec	Second
t	Ton
t.c.f.	Ton of conditional fuel = 29 308 KJ = 0,7 ton of oil equivalent
t/p	Ton per person
tJ	Terra joule = 1000 000 000 000 joules
thous	Thousand
thous. t	Thousand tons



## ANNEXES



## Activity Matrix

The activity matrix for national capacity-building is based on priorities to provide the best positive impact for the implementation of the three global environmental protection Conventions (climate change, biodiversity conservation and combating desertification) in the Republic of Tajikistan. The matrix represents an institutional and organizational framework for improved implementation capacity in priority areas. These priorities were identified at previous stages of the Self-Assessment of the National Capacity Project.

Selection of priorities was based upon their potential impact on the environment, development advantages, economic efficiency, feasibility and reliability, market capacity and socio-economic significance. Other priority factors included scaling down of negative impacts in the future and the possibility of cost and loss reduction.

The attached matrix consists of a list of measures aimed at resolving capacity-building problems through tasks that have the highest cross-effect in all Conventions. These measures include capacity-building activities in the implementation of the Conventions at the systematic, institutional and individual levels in accordance with the country's commitments under the three Conventions.

Measures for joining efforts to implement the three environmental protection Conventions are oriented at the national implementation level with regard to the specifics of each Convention's needs and priority problems for the purpose of the republic's sustainable development. Each of these priorities has its specific capacity-building problems and needs requiring urgent measures to strengthen capacity in this specific area.

The first narrative section includes the description of a problem requiring an adequate solution. The following section represents a description of a planned measure and its main components. The next matrix section includes information on the expected synergistic effect and impact on capacity-building within the context of the

three Conventions. Other sections include data on the capacity-building level as a result of the implemented activity, timeframe and responsible organizations.

Matrix measures are indexed according to their priority and implementation level (systemic, institutional and individual).

The following abbreviations show tentative funding sources:

- OF Owned funds;
- OBF Out of the budget environmental funds (penalty deductions, fees for the use of natural resources and other means of environmental protection funds);
- IP International projects and investments;
- IG International grants;
- IF International financial implementation mechanisms of the Framework Convention (Mechanism of Clean Development, Carbon Fund, operational programs of the Global Environmental Facility, grants);
- PI Private investments;
- IR Internal reserves (voluntary commitments or other means).

The section on "Common Synergism" represents a combination of outcomes that can be achieved upon the implementation of activities, including direct and indirect implementation effects. The section on "Funding Sources" indicates potential sources and mechanisms of funding, including:

- (OF) owned funds, (OBF) out of the budget environmental funds;
- (IP) technology and investment transfer; international financial mechanisms and grants; (IG) for the implementation of global environmental Conventions; and (IR) internal reserves.

Depending on the authority and functions of the government agencies or other economic factors, the next section ("Responsible Organization") determines



organizations responsible for the implementation and/or evaluation of these national capacity-building activities. The timeframe is defined according to the urgency of measures, availability of required resources and the volume of work. When

identifying the timeframe, the matrix developers assumed that due to the achieved scientific, technical and economic results, there might be a need for the improvement and development of new measures.



**Capacity-building measures under the implementation of priority directions in the context of the three Conventions: Convention on climate change, Convention on biodiversity conservation and rational use and Convention on combating desertification in Tajikistan**

<i>Priority 1. Effective power and water resource management</i>						
<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organizations</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>1</b>	Inadequacy of the legislative base for the rational use of water resources.	Elaboration of the state policy on water resource distribution at the national and regional levels.	Legislative base for the solution of trans-boundary problem of water and power resource distribution.	Parliament, Government, MFA, MIWM, ISAF	2005-2007	<b>OF, IP</b>
<b>2</b>	Ineffective water resource management.	Improved efficiency of economic instruments of water resource management. Introduction of a concept of administrative-geographic water-economy arrangement of the national territory.	Normative base for economic instruments in the sphere of water resources protection and management.	MIWM, MA, AS, SCEPF	2005-2007	<b>OF, IP</b>
<b>3</b>	Lack of incentives for rational water-use.	Elaboration of differentiated tariffs dependent on water supply costs, priority of cultivated crops, environmental damage, etc.	Rational and effective use of water resources.	ME, MET, MIWM, MA	2005-2008	<b>OF, IP</b>
<b>4</b>	Inadequate regulation of water resource contamination.	Improvement of the legislation and revision of norms regulating permissible level of water resource pollution.	Normative base for the regulation of water resource pollution.	AS, SCEPF, MIWM, MH	2005-2007	<b>OF, IP</b>
<b>5</b>	Inadequate information on the status of water and power resources.	Development of a program aimed at the study of water and power resource status by the Academy of Sciences and scientific-research sector institutes.	Reliable data on the status of water resources in the country.	AS, MIWM, ME, HMS	2005-2007	<b>OF, IR</b>
<b>6</b>	Improper recording methodologies of water and power resources.	Introduction of international methodologies and statistical standards for the record of water and power resources.	Improved understanding of the problem by potential investors. Improved reliability of the recorded data on water and power resources.	SSC, HMS, MIWM, ME	2005-2015	<b>OF, IP</b>
<b>7</b>	Imbalanced tariff policy in energy sector.	Development of economically balanced power tariffs.	Cost recovery of energy production. Availability of operational funds.	ME, MET	2005-2010	<b>II, OF</b>

<b>Priority 1. Effective power and water resource management</b>						
<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organizations</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>8</b>	Power-supply problems in remote areas.	Stimulation and development of alternative energy. Adoption of a Concept (Law) on the development of alternative and renewable energy in the Republic of Tajikistan.	Legislative base for the development of alternative and renewable energy. Reduced pressure on biological resources. Improved status of ecosystems.	ME, Hydro-Energy-Project, AS	2005-2010	<b>OF, IG, TA</b>
<b>9</b>	Absence of economic instruments stimulating the development of mini-hydro facilities.	Elaboration of normative-legal mechanisms for lease, long-term and prior redemption of mini-hydro facilities.	Increased interest of international and domestic investors in mini-hydro development.	Parliament, SCEPF, MET, ME	2005-2007	<b>OF, IG</b>
<b>10</b>	Lack of operative information on the impact of natural and anthropogenic factors on water and power resources.	Restoration and improvement of the system of hydrological observation and monitoring of glaciers. Provision of observation posts with updated equipment. Expansion of the observation network.	A system of operational data collection and processing with regard to environmental components that make an impact on water and power resources. Fast and adequate response.	HMS, SCEPF, AS, MIWM, ME, MH	2005-2008	<b>IP, IG, OF.</b>
<b>11</b>	Poor water resource management.	Creation of an automatic registration system of water consumption on the basis of GIS technologies. Wide application of computer modeling.	Rational water resource management will considerably reduce the risk of desertification. Significant improvement of environmental situation in agriculture thanks to reduced water losses.	HMS, SCEPF, MIWM, AS	2006-2010	<b>IP, TA</b>
<b>12</b>	Considerable loss of heat and unstable heat supply.	Rehabilitation of heating systems and heat-insulation of buildings. Introduction of an independent heating system and closed system of hot-water supply.	25-30% power savings.	ME, khukumats	2006-2010	<b>IG, IG, PI</b>
<b>13</b>	Poor development of alternative energy in the country.	Assessment of the use of small rivers' capacity in the proposed areas of micro- and mini-hydro construction. Construction of micro- and mini-hydro in remote and mountainous areas. Use of solar energy, wind, and bio-gas.	Power supply of remote areas.	ME, MET, khukumats	2005-2015	<b>OF, IP</b>

<b>Priority 1. Effective power and water resource management</b>						
<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organizations</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>14</b>	Considerable loss of electrical energy.	Use of highly effective equipment in all branches of economy. Introduction of a system of gas/other fuel and electrical power control. Reconstruction and improvement of electrical grids.	Power and resource savings, reduced electricity loss, sustainable power supply.	ME, MI	2005-2010	IP, II, IA, OF
<b>15</b>	Poor efficiency of existing irrigation methods.	Establishment of structures introducing progressive irrigation methods (discrete, subterranean, drip and spray irrigation) and modernization of irrigation systems. Introduction of progressive irrigation methods.	General improvement in water resource situation, conservation of soil fertility. Improved efficiency of irrigation systems. Reduced loss of water for evaporation and filtration.	MIWM, MA, SCEPF	2005-2015	I[???, MII, IA, OF
<b>16</b>	Absence of qualified specialists on mini-hydro.	Establishment of a faculty (course) on mini-hydro in the Technical University.	Qualified mini-hydro specialists.	MED, ME	2005-2010	OF, IR
<b>17</b>	Lack of knowledge of modern irrigation methods.	Organization of workshops and training courses, constant information exchange with countries applying advanced irrigation technologies.	Highly qualified specialists applying updated irrigation technologies.	MA, MIWM, TAAS, SLMC	2005-2007	CC, BP
<b>18</b>	Lack of perception of the idea and advantages of complex management in catchment areas.	Pilot project on the effective management of catchment areas. The project should be aimed at demonstrating the advantages of complex management of catchment areas, which makes it possible to reduce intensity of erosion processes.	Pilot testing of the method of complex mountain ecosystem management. Possibility of considerable increase in awareness and interest among the population.	MIWM, SCEPF, MA, SLMC	2006-2008	IP, IG, IR
<b>19</b>	No incentives for professional growth in the sphere of water resource management.	Modification of the remuneration system, salary raise, introduction of multi-level system of material and non-material incentives dependent on the results of professional growth.	Mechanisms of incentive aimed at the professional growth of specialists.	MET, MF, MIWM	2005	OF, IR

**Capacity-building measures under the implementation of priority directions in the context of the three Conventions: Convention on climate change, Convention on biodiversity conservation and rational use and Convention on combating desertification in Tajikistan**

<b>Priority 2. Rational land use and reforestation</b>						
<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>1</b>	Lack of administrative measures against violators of environmental protection legislation.	Strengthening Administrative Code. Introduction of penalties for grazing on any type of property beyond the bounds of allotted territories, for legal and physical persons for contamination of soils (lands) with solid domestic wastes, and violation of crop rotation regulations.	Increased responsibility of physical and legal persons for environmental damage.	Parliament, SCEPF, AS	<b>2005-2006</b>	<b>OF</b>
<b>2</b>	Inadequacy of economic and market mechanisms.	Improvement of economic instruments and normative base on the identification of economic loss caused by pasture degradation and violation of crop rotation regulations, grazing norms and the use of steep slopes.	Economic base regulating relations of forestry and land end-users with governmental structures.	SCEPF, Institute of Economy, AS, Center of Strategic Studies	<b>2005-2007</b>	<b>OF, IR</b>
<b>3</b>	Non-compliance of existing areas of preferential protection (APP) with the conservation objectives of forest ecosystem.	Development of a legislative basis for the creation of the National Environmental Network, delimitation and other main components of the National Environmental Network.	Creation of favorable political, economic and administrative conditions for ecosystem conservation.	Parliament, SCEPF	<b>2005-2007</b>	<b>OF, IP</b>
<b>4</b>	Lack of funding for the APP.	Introduction of entry, transit and parking fees in designated locations on the territory of APP. Development of ecological tourism.	Reduced pressure on the state budget. Available resources for the development of infrastructure and APP maintenance.	SCEPF, MET, MF	<b>2005-2008</b>	<b>OF</b>
<b>5</b>	Poor ecological regulation system of land use.	Elaboration of environmental taxes for land use; regulating the use of steep slopes; development of a payment system for grazing.	Additional funding source for soil-protection activity and reforestation.	Parliament, Government, SLMC, AS	<b>2005</b>	<b>OF</b>
<b>6</b>	Non-compliance of the legislative base on land use with rapidly changing production relations in the economy.	Introduction of amendments in the Law "On Nature Protection" in view of a wide expansion of farms and dekhkan farms, including environmental criteria for land use.	Legislative framework for the activity of farms and dekhkan farms located in vulnerable ecosystems; basis for their sustainable development.	Parliament, Government, SLMC, SCEPF	<b>2005-2006</b>	<b>OF</b>

<b>Priority 2. Rational land use and reforestation</b>						
<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>7</b>	Irrational use of lands.	Modification of the procedure for the transfer of agricultural and forestry reserves to residential construction.	Reduced agricultural and forestry reserves transferred for individual residential construction.	SLMC, Gyprozem	2006-2008	<b>IP</b>
<b>8</b>	Lack of financial insurance mechanisms against desertification and biodiversity loss.	Creation of a special insurance fund aimed at combating desertification and biodiversity loss. The fund's resources consist of special contributions from domestic and foreign investors, deductions interest, penalty fees and various types of voluntary payments.	Real structure capable of providing sustainable funding in an emergency.	SCEPF, MET, MF, SLMC	2005-2006	<b>IP, EP, IR</b>
<b>9</b>	Poor database on forestry for operational management and long-term planning on global environmental management.	Creation of a database on forestry, forestry economy and carbon absorption.	Operative information on the components of biological diversity related to forest ecosystems and carbon absorption. Basis for planning and effective implementation of projects and activities under the framework of Global Environmental Management.	SCEPF, AS	2005-2006	<b>IP, IR,</b>
<b>10</b>	Lack of planting material for reforestation.	Expansion of existing nurseries' area and creation of new nurseries aimed at increasing forestry planting rate. In perspective, annual planting rate should achieve 5 thousand ha which will make it possible to create forestry protection belts and restoration of forests.	Real opportunity for reforestation and restoration of biological diversity related to forest ecosystems. Increased carbon content in forest biomass. Reduction in areas impacted by desertification.	SCEPF, MA	2005-2010	<b>OF, IP</b>
<b>11</b>	Widespread erosion processes due to the absence of advanced soil-protection technologies.	In cooperation with the AS, creation of a research group within the Ministry of Agriculture that would promote and integrate advanced soil-protection technologies in agriculture with the use of administrative and economic methods.	Information gathering on applied advanced technologies and the intensity of erosion processes. Reduction in erosion processes.	AS, SCEPF. MA. SLMC, TAAS	2005-2008	<b>OF, IP</b>

<b>Priority 2. Rational land use and reforestation</b>						
<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>12</b>	Insufficient application of field-protective forestation.	Creation of design groups for the elaboration of projects aimed at optimal localization of forestry protective belts in different parts of the country.	Considerable reduction in erosion processes. Increased soil fertility.	SCEPF, MA, MIWM, SLMC	2005-2008	<b>OF, IP</b>
<b>13</b>	Poor study and introduction of biological methods to improve soil fertility.	In cooperation with the Ministry of Agriculture, creation of an experimental station of the AS for the development of biological methods of soil fertility, reclamation of sandy and stony soils, and increase in their biological activity.	Pilot testing of technologies contributing to an increased carbon absorption by soils and reduced emissions. Deceleration of land degradation processes. General environmental improvement.	AS, MA, SCEPF, TAAS	2005-2006	<b>IP, IR, OF</b>
<b>14</b>	Insufficient research on economic consequences of direct and indirect impacts on environment.	Research on economic justifications aimed at the development of incentives within the context of the three Conventions. The research will combine scientific capacities of the Institute of Economy of the AS, Ministry of Agriculture, Ministry of Irrigation and Water Management, and the SCEPF to elaborate balanced decisions for implementing the three Conventions.	Scientifically based recommendations for rational land use and reforestation. Implementation of international projects. Economic base for the implementation of the proposed measures under the three Conventions.	AS, MET, SCEPF, MA, MIWM	2005-2006	<b>IR, IP, OF, IG</b>
<b>15</b>	Poor training of young specialists.	Creation of new positions responsible for cooperation with the industrial sector in all respective higher educational institutions.	Improved understanding of the three Conventions by university professors. Provision of valid student practice in scientific institutions and industry.	MED	2005-2008	<b>OF, IP</b>
<b>16</b>	Lack of incentive on part of specialists.	Elaboration and introduction of additional material and moral incentives for personnel involved in project implementation under the Global Environmental Conventions. Integration of economic accountability.	Increased interest on part of specialists at all levels.	MET, MF	2005-2006	<b>IP, IR</b>

<b>Priority 2. Rational land use and reforestation</b>						
<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>17</b>	Poor awareness and efficiency of personnel.	Introduction of a system of continued education and regular work audit. Organization of continued training and probation of staff and specialists from interested parties.	Increased awareness and decision-making capacity to meet the modern requirements of Global Environmental Management.	<b>SCEPF, MA, MET</b>	<b>2005-2007</b>	<b>OF, IP, IR</b>

**Capacit- building measures under the implementation of priority directions in the context of the three Conventions: Convention on climate change, Convention on biodiversity conservation and rational us, and Convention on combating desertification in Tajikistan**

<b>Priority 3. Coordination of activities at the inter-agency and institutional levels based on monitoring and information exchange</b>						
<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>1</b>	Lack of a single perspective of an environmental monitoring system among different agencies.	Elaboration of a national concept of environmental monitoring.	Common basis for identifying measures for creating a national monitoring system.	SCEPF, MIWM, HMS	<b>2006-2007</b>	<b>OF, TA</b>
<b>2</b>	Poor coordination among the Conventions (CCD, CBD and CCC).	Improvement of existing mechanisms and development of new mechanisms of coordination aimed at creating of favorable conditions for maximum, effective implementation of the three environmental protection Conventions.	Coordination mechanisms providing a joint solution of tasks for the implementation of the three environmental protection Conventions.	SCEPF, implementation centers	<b>2005-2006</b>	<b>IP, IG</b>

**Priority 3. Coordination of activities at the inter-agency and institutional levels based on monitoring and information exchange**

<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>3</b>	Difficult access of interested parties to environmental information stored in various agencies.	Improvement of the legislative-normative base regulating the transparency of various data stored by different agencies to provide unimpaired access to environmental information in accordance with the Aarhus Convention. Development and introduction of effective mechanisms of interaction with environmental information users.	Legislative base and procedures promoting access to monitoring results and other existing environmental information. Developed and coordinated mechanisms of interaction.	SCEPF, implementation centers, SSC	2005-2008	<b>OF, TA</b>
<b>4</b>	Insufficient legislative justification for the open process of ecological expertise.	Amend the existing Law "On Ecological Expertise" to modify the mechanism for assessing environmental impact and ecological expertise in accordance with the global environmental protection Conventions.	Legislative mechanism reducing the risk of poor decision-making that results in environmental damage.	Parliament, Government, SCEPF	2006	<b>OF</b>
<b>5</b>	Absence of mechanisms regulating arguments in the course of ecological expertise.	Creation of legislative instruments providing transparency of ecological expertise and involvement of interested parties.	Instruments providing transparency of decision-making.	SCEPF	2006-2007	<b>OF, IP</b>
<b>6</b>	Poor interaction between monitoring systems.	Integration of existing monitoring systems of biological diversity, desertification and hydro-meteorology within the system of environmental monitoring, data collection and unification.	Unified format of environmental information.	SCEPF	2005-2006	<b>OF, IP, FI</b>
<b>7</b>	Absence of a central center for environmental monitoring data collection and processing	Establishment of an environmental monitoring center, including a database that uses Geographic Information Systems (GIS).	Unified database considerably increases modeling capacities of environmental impact and adequate response.	SCEPF	2006-2007	<b>IP, IR, IG</b>

**Priority 3. Coordination of activities at the inter-agency and institutional levels based on monitoring and information exchange**

<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>8</b>	Poor interaction between international monitoring systems.	Nation's incorporation into the Global Environmental Monitoring System (GEMS), Scientific-Research Center of Monitoring and Evaluation (SRCME).	Additional opportunities for international cooperation.	SCEPF, MFA	2005-2006	<b>IP, OF</b>
<b>9</b>	Poor methodological justification and insufficient software for the global environmental forecasting.	Introduction of the newest methodologies of environmental forecasting and modeling, restoration of aerial-visual survey, satellite Earth observation network connection, and the use of updated methods of decoding and processing of satellite information.	Reliable forecast of environmental changes and timely planning of adaptation measures.	SCEPF, HMS	2005-2015	<b>IP, TA, IP</b>
<b>10</b>	Poor coordination between research institutions on the three Conventions.	Creation of a Coordinating Center on environmental protection Conventions.	Scientific council helps avoid overlap and achieves synergy in the implementation of the environmental protection Conventions.	SCEPF	2005-2007	<b>OF, IP</b>
<b>11</b>	Lack of appreciation for Conventions' interrelation on part of specialists involved in the global environmental management process.	Regular meetings for information exchange on environmental protection Conventions.	Better team coordination in the implementation of environmental Conventions.	SCEPF, PIU	2005-2008	<b>IP</b>
<b>12</b>	Low educational level of specialists involved in monitoring and data processing.	Implementation of scientific-technical education and training of qualified personnel on an inter-agency basis.	Significantly advanced qualification of specialists for the implementation of the three Conventions.	SCEPF, MED	2005-2010	<b>OF, IP</b>
<b>13</b>	Lack of specialists on environmental monitoring.	Establishment of an environmental monitoring department in the Tajik Technological University.	Meeting the fast growing demand in professional cadre.	SCEPF, MED	2006	
<b>14</b>	Absence of print edition for information exchange.	Publication of a monthly bulletin covering the implementation of the three Conventions for dissemination amongst the agencies involved.	Print media for information dissemination.	PIU, FCCC, CBC, CCD	2005-2015	<b>IP, OF</b>

**Priority 3. Coordination of activities at the inter-agency and institutional levels based on monitoring and information exchange**

<b>No n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
15	Absence of a website for operational information exchange on the three Conventions.	Creation of a website for information exchange at the national and international levels.	Website for operational dissemination of information on the three Conventions.	PIU, CCC, CBC,	2005-2015	IP, OF

**Capacity-building measures under the implementation of priority directions in the context of the three Conventions: Convention on climate change, Convention on biodiversity conservation and rational use and Convention on combating desertification in Tajikistan**

**Priority 4. Disaster prevention and mitigation**

<b>No n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
1	Inadequate legal basis for natural disaster status.	Improvement of the Laws of the RT "On Civil Defense" (1996) and "On Emergency Situation Regime" (1999).	Legislative framework providing maximum effect in disaster prevention and mitigation.	Parliament, Government, MoECD	2005-2006	OF, IP
2	Inadequate normative base identifying measures to protect communities against natural disasters.	Revision and adoption of the Law of the RT "On Population Protection."	Legislative basis for population protection against natural hazards, damage assessment and resolution of consequences of natural disasters.	Parliament, Government, MoECD	2005-2006	OF
3	Insufficient management of disaster response process.	Elaboration and implementation of a complex of measures aimed at resolving consequences of natural disasters.	Normative base and improved disaster management.	HMS, MoECD, MH	2005	IP, TA

<b>Priority 4. Disaster prevention and mitigation</b>						
<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>4</b>	Absence of a national program of hydro-meteorology development.	Elaboration of a national program of hydro-meteorology development in the Republic of Tajikistan.	Creating basis for improved natural disaster prediction and disaster mitigation.	HMS, SCEPF, MET, MF	2005-2006	<b>OF, IP</b>
<b>5</b>	Poor research and monitoring of dangerous natural hazards.	Establishment of a special unit within the Geological Survey for the study of hazardous geological phenomena. Strengthening of scientific capacity of the Institute of Geology and Institute of Earthquake Engineering and Seismology of the AS, RT and Hydro-Meteorological Survey.	Scientific focus on the most strategically important directions. Scientific justification for the prediction of dangerous natural phenomena.	SGS, AS, HMS, SCEPF	2005-2007	<b>OF, IP, IG</b>
<b>6</b>	Poor observation network for the forecasting and computer modeling of natural hazards.	Restoration and improvement of the existing hydro-meteorological observation network with an optimal density of hydrological stations and posts of 1 per 1,000 sq. km.	Optimal observation network providing information on natural hazards.	HMS, MoECD, SCEPF	2005-2010	<b>OF, IP, TA</b>
<b>7</b>	Difficulties in conducting observation in remote and hard-to-reach areas.	Introduction and expansion of the network of automatic sensors for the registration of snow accumulation, air temperature, intense precipitation and floods (sharp changes of river water level).	Effective networking of remote and hard-to-reach areas.	HMS, SCEPF	2005-2008	
<b>8</b>	Obsolete methods of data processing.	Modernization of the data collection, processing, analysis, interpretation and operative dissemination system. Creation of GIS databases and computer models of natural hazards' formation and impact.	Reliable systems of natural hazard prediction.	AS, HMS, SCEPF	2005-2010	<b>OF, TA</b>
<b>9</b>	Vulnerability of agriculture to hail.	Building the capacity of anti-hail service. Provision of anti-hail equipment for the protection of 200-300 thousand ha territory.	Considerable reduction of agricultural damage as a result of anti-hail measures.	SCEPF, MoECD, HMS, MA, khukumats	2005-2008	<b>OF, IP</b>
<b>10</b>	Absence of reliable communication with remote areas most prone to natural hazards.	Establishment of a coordinating center at the MoECD. Providing remote settlements with reliable autonomous satellite communications systems.	Receiving operative and timely information on natural hazards.	MoECD, MC	2005-2008	<b>OF, IP</b>

<b>Priority 4. Disaster prevention and mitigation</b>						
<b>No n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
11	Poor search-and-rescue staff training.	Continued search-and-rescue staff training and drill exercises in the country and jointly with rescue services of other countries.	High level of preparedness of search-and-rescue teams.	Government, MFA, MoECD	2006-2010	OF, IP
12	No "Children in emergency" training at the school level.	Introduction of the subject of disaster preparedness subject into school curriculum.	School-children gain disaster preparedness skills.	MED, MoECD	2005-2006	OF
13	Poor level of preparedness for natural disasters amongst general population.	Community training in disaster management and provision of training and methodological manuals and audio/visual aids.	Appropriate behavior in the event of a natural disaster. Considerable reduction of property damage and human casualties among the population.	MoECD, mass media	2005-2015	OF, IP

**Capacity-building measures under the implementation of priority directions in the context of the three Conventions: Convention on climate change, Convention on biodiversity conservation and rational use and Convention on combating desertification in Tajikistan**

<b>Priority 5. Public involvement and participation, partners' awareness and ecological education</b>						
<b>No n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
1	Inadequate legislation regulating various aspects of NGO activity.	Improvement of existing legislation and development of new normative acts regulating various aspects of NGO activity.	Determination of NGO status in the society. Expanded opportunities for NGO integration in the society.	Parliament, NGO	2005-2006	OF, IP
2	Poor partnership relations among different sectors on the three Conventions.	Elaboration of measures ensuring a cross-sector dialogue. Regular meetings and consultations.	Change of stereotypes. Improved cooperation mechanisms.	SCEPF, media, NGO	2005-2007	OF, OBF, PI

**Priority 5. Public involvement and participation, partners' awareness and ecological education**

<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>3</b>	Financial difficulties in the activity of public associations.	Introduction of changes and amendments to the Tax Code to stimulate charity work on part of business structures; tax exemption for NGOs.	Creation of favorable atmosphere promoting fruitful activities of public associations.	Parliament, NGO	2005-2006	<b>OF</b>
<b>4</b>	Absence of provisions to raise awareness of the three Conventions and lack of a program of ecological education and training.	Introduction of changes into the "State Program of Ecological Education and Training of the population of the Republic of Tajikistan for 2000-2010."	Constant ecological education.	Parliament, NGO, SCEPF, MED	2005-2015	<b>OF</b>
<b>5</b>	Poor awareness of different environmental specialists within the context of the three Conventions.	Improved system of comprehensive ecological education and community training. Development of training materials and organization of training and advanced training courses; workshops for school teachers and university professors in the context of the three Conventions.	Population's increased awareness of climate change, biodiversity conservation and combating desertification.	MED, SCEPF	2005-2008	<b>OF, IP</b>
<b>6</b>	Poor legal basis for effective implementation of measures to increase public awareness.	Adoption of a number of normative-legal acts aimed at increasing public awareness within the context of the three Conventions.	Improved base for the activity of the Ministry of Education, khukumats, mass media and enterprises.	Parliament, Government, SCEP, MED	2005-2006	<b>OF</b>
<b>7</b>	Concentration of authority in the hands of high-level decision-makers.	Improved legislation on public participation in the decision-making process and access to information.	Legislative mechanisms for the differentiation of authorities in decision-making in the area of environmental protection.	Parliament, NGO	2005-2008	<b>OF</b>
<b>8</b>	Poor coordination between ecological NGOs and government structures in the context of the three Conventions.	Strengthened activity of the Public Ecological Council. Establishment of a structural unit in the SCEPF to coordinate activities of environmental NGOs and government agencies.	Strengthened efficiency and interaction of ecological NGOs and government agencies.	SCEPF, NGO	2005-2007	<b>OF</b>
<b>9</b>	Poor promotion of ecological tourism.	Creation of a center of ecological tourism. Development of ecological tourism.	Education in ecological values. Additional funding for the implementation of the three Conventions.	SCEPF	2005-2010	<b>IP, OBF</b>

**Priority 5. Public involvement and participation, partners' awareness and ecological education**

<b>№ n/n</b>	<b>Problems</b>	<b>Capacity-building measures</b>	<b>Expected results</b>	<b>Responsible organization</b>	<b>Time frame (years)</b>	<b>Funding sources</b>
<b>10</b>	Lack of information support of the SANC in Tajikistan.	Creation of a SANC Information Center in Tajikistan.	Timely public information on SANC implementation.	SCEPF	2005-2006	<b>IP</b>
<b>11</b>	Ambitions and isolationism of NGO leaders.	Development and adoption of the Code of Honor for all environmental NGO members. Expanded transparency and openness concerning all aspects of NGO activity.	Improved trust in NGOs. Cooperative development between NGOs.	NGO	2005-2006	<b>IG</b>
<b>12</b>	Lack of environmental priority values among young people.	Modification of educational curricula: integration of "ecology" subject in programs of all higher educational institutions with regard to the context of the three Conventions.	Dissemination of knowledge on environmental values among future specialists.	MED	2005-2008	<b>II, OF</b>
<b>13</b>	Lack of scientific-popular and informative print media promoting the three Conventions.	Publication of a magazine covering the aspects of the three Conventions in Tajikistan, along with other important environmental problems.	Available and interesting information source on the subject of the three Conventions.	SCEPF, AS, NGO	2005-2006	<b>IG, IP, OBF</b>
<b>14</b>	Poor use of radio and TV for increasing public awareness.	Organization of a cycle of TV and radio shows on the issues of the three Conventions and global environmental protection.	Raising awareness of the wider public in the context of the three Conventions.	SCEPF, MC, NGO	2005-2007	<b>IP, II</b>
<b>15</b>	Limited access to the Internet.	Expanded access to the Internet. Stimulating Internet access in remote areas of the country. Provision of free Internet access for low-income population.	Wider access of the population in the context of the three Conventions.	MC, NGO	2005-2007	<b>IP, IG, IR</b>