

COUNTRY
PORTFOLIO
EVALUATION

Tajikistan (1999–2015)

Volume 2: Technical Documents





1818 H Street, NW, Mail Stop P5-500, Washington, DC 20433 USA
Tel: +1 (202) 473-4054 / Fax: +1 (202) 522-1691

Country Portfolio Evaluation Tajikistan (1999–2015)

Volume 2: Technical Documents

February 2017

Table of Contents

Technical Document A Country Environmental Legal Framework	2
Technical Document B: Global Environmental Benefits Assessment	30
Technical Document C: Progress Toward Impact – Case Studies	65

Technical Document A
Country Environmental Legal Framework

TABLE OF CONTENTS

Abbreviations	4
1. Introduction	5
2. Laws and Regulations	5
2.1 Basic Provisions in the Constitution	5
2.2 Framework Environmental Law	5
2.3 Water Code	6
2.4 Forest Code	6
2.5 Land Code and Other Land Administration Laws	6
2.6 Environmental Impact Assessment Laws	7
2.7 Main Environmental Laws	8
3. National Sustainable Development Frameworks	11
4. National Institutions Involved in the Environment Sector	13
5. International Environmental Commitments	16
6. Implementation Status and Challenges	21
Environmental Regulations	21
Public Participation and Gender	21
Licenses	21
Environmental Permits	21
Environmental Norms and Standards	22
Enforcement Instruments	22
Implementation Status by GEF Focal Area	22
Biodiversity	22
Climate Change	23
International Waters	24
Land Degradation and Sustainable Forest Management	24
Chemicals and Waste	24
Challenges	25
Annex A.1. References	26
Annex A.2. Committee for Environmental Protection - Organization Chart	29

Abbreviations

CBD	United Nations Convention on Biological Diversity
CEP	Committee for Environmental Protection
CIS	Commonwealth of Independent States
EIA	Environmental Impact Assessment
EPA	Environment Protection Agency
FSP	full-size project
GEF	Global Environmental Facility
GHG	Greenhouse gas
ODS	ozone depleting substance
POP	persistent organic pollutant
SEE	State Ecological Expertise
UNCCD	United Nations Convention on Biodiversity
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

The Country Environmental Legal Framework technical document reports on Tajikistan's environmental legislation and environmental policies (plans, strategies, and others) as well as on the international agreements/conventions ratified, accessed, and enacted in the country. This information is presented and analyzed through time, since the start of GEF activities to date (1999—2014).

Tajikistan has a well-developed environmental legal and regulatory framework. Current environmental legislation in Tajikistan includes statutory acts and laws on: protection of the environment; ecological audit and monitoring; protection of flora and fauna; environmental information and education; soil, water, and air quality; biological safety; human health and safety; and waste and chemicals management. These laws, along with the regulations approved by the Government of Tajikistan, create a favorable legal framework for environmental protection, and use and protection of the country's natural resources. They also enforce the rights of any citizen to environmental safety, organic products, an ecofriendly environment, access to environmental information, and the possibility of investing (moral, material, and financial) to improve the ecological situation in the country. The most relevant of these laws, codes, and regulations within the GEF focal areas are highlighted in the sections below.

2. Laws and Regulations

2.1 Basic Provisions in the Constitution

The environment is very much present in Tajikistan's legal agenda. The Constitution of the Republic of Tajikistan was adopted in 1994, and amended in 1999 and 2003. It recognizes public and individual rights to a safe and healthy environment. In particular, Article 38 stipulates that “every person has the right to health care. This right is ensured by providing free medical assistance in state medical establishments and by measures aimed at protecting environment, developing mass sport, physical training, and tourism” and Article 44 states that “the protection of nature, historical and cultural heritage is the duty of every person” (Republic of Tajikistan 1994).

Under the constitution, land and mineral resources, water, air, animals and plants, as well as other natural resources, belong exclusively to the State. Article 13 stipulates that “the land, its resources, water, airspace, fauna and flora, and other natural resources are exclusively the property of the State, and the State guarantees their effective use in the interests of the people”.

Beyond those general articles contained in the constitution, environmental protection and other related issues are reflected in the articles stipulated by other statutory legislative acts.

2.2 Framework Environmental Law

Since the start of GEF activities in Tajikistan in 1999 the framework environmental law was the Law of the Republic of Tajikistan on Nature Protection (No. 905, December 27, 1993; enacted in 1994 and amended in 1996, 1997, 2002, 2004, and 2007). This law presented a legal foundation for the state policy in the field of environmental protection and aimed at ensuring sustainable socioeconomic development, human rights guarantees for a healthy and favorable environment, strengthening the rule of law, preventing the negative impacts of economic and other activities on the environment, and ensuring the management of natural resources and ecological safety.

The framework environmental law was replaced by the Law on Environmental Protection (No. 760, August 2, 2011). This law stipulates that Tajikistan's environmental policy should give priority to environmental actions based on scientifically proven principles that combine economic and other activities having a potential negative impact on the environment, with nature preservation and the sustainable use of resources. The law defines the applicable legal principles, the protected objects, the competencies and roles of the government, the Committee for Environmental Protection (CEP) under the Government of Tajikistan, the local authorities, public organizations, and individuals. Another key aspect of this law is that it stipulates measures to secure public and individual rights to a safe and healthy environment and requires a combined system of relevant activities that prevent or mitigate negative impacts on the environment. Furthermore, the law defines environmental

emergencies and ecological disasters and prescribes the order of actions in such situations, defines the obligations of officials and enterprises to prevent and eliminate the consequences, as well as the liabilities of persons or organizations that caused damage to the environment or otherwise violated the law.

On the enforcement side, the law establishes several types of controls over compliance with environmental legislation: state control, ministerial control, enterprise control, and public control. Public control is carried out by civil society organizations or trade unions and can be exercised with respect to any governmental body, enterprise, entity, or individual.

2.3 Water Code

The Water Code (No. 34, November 29, 2000, wording of the laws No. 381, March 20, 2008; No. 572, December 3, 2009; No. 744, June 6 2011; and No. 821, April 16, 2012) stipulates policies on water management, issuance of water use permits, dispute resolution, usage planning, and cadaster. It promotes rational use and protection of water resources and defines the types of water use rights, authority and roles of regional and local governments for water allocations among various users, collection of fees, water use planning, water use rights, and dispute resolution.

2.4 Forest Code

The Forest Code of Tajikistan was approved in 1993 (No. 770, June 24, 1993) and amended twice in 1997 and 2008 (wording of the laws No. 421, May 15, 1997 and No. 352, August 1, 2008). The code stipulated the policies on forest management, permitting, dispute resolution, usage planning, and cadaster. It also promoted rational use and protection of forestry resources and defined the types of use rights, authority and roles of regional and local governments for forestry resources use rights and dispute resolution among various users, collection of fees, forestry development planning, among others.

In 2011, a new Forest Code of Tajikistan (No. 761, August 2, 2011) replaced the previous. The new Forest Code, in compliance with the above-mentioned general provisions, requires that everyone is responsible for forestry prescriptions, ensures that prescriptions include appropriate species selection, stocking, and specific free growing requirements. With this code an ecological and ecosystem-specific approach to the selection of tree species and stocking has been introduced.

Other normative acts and program documents related to forestry worth mentioning include: the provision on the protection of forests (1999); the provision on the use of dekhan land rights as a collateral in sustainable forestry (1999); the concept framework of forestry development of the Republic of Tajikistan through 2005; and the provision on government control over the conditions, use, reproduction, conservation, and protection of forests (2000).

2.5 Land Code and Other Land Administration Laws

The current Land Code¹ regulates land relations among users and it is directed at the rational “use and protection of land and fertility of the soil.” The land may be used in a “rational manner” only and the code allows local authorities to decide what constitutes “rational” land use.

The Law on Land Administration (No. 356, January 5, 2008) obliges the land administration authorities to map and monitor the quality of land, including soil contamination, erosion, and water logging. It provides requirements for planning and rational use of the land in Tajikistan.

The Law on Land Assessment (No. 18, May 12, 2001; wording of the law No. 262, May 12, 2007) establishes the legal basis for cadastral assessment of the land in the Tajikistan and defines the technical requirements for conducting a land assessment.

¹ No. 327 (December 19, 1996; wording of the laws No. 746, May 14, 1999; No.15, May 12, 2001; No.23, February 28, 2004; No. 199, July 28, 2006; No. 357, January 5, 2008; No. 405, June 18, 2008; No. 704, March 25, 2011; No. 819, April 16, 2012; and No. 891, August 1, 2012).

Other substantial legislative acts regulating relationships in the field of the land use are the Law on Land Reform (No. 594, March 5, 1992, and amended in 1994, 1995, 1997, and 2006) and the Resolution on the Government on Control over Land Use and Land Protection (1997). The land reform law stipulates the requirements for effective use of land, the application of environmental protection technologies, and the measures to be taken against the deterioration of the land caused by economic activity. Provisions in the law include the creation of the conditions for an equal development of various forms of land activity, establishment of a national economy based on various types of ownership, and rational use and protection of lands subjected to intensified agricultural production. Land legislation also regulates land management relations between state bodies, local self-governance, authorized government entities in the area of land resource management, as well as any other physical and legal persons.

2.6 Environmental Impact Assessment Laws

There are two laws in Tajikistan that stipulate how to conduct an Environmental Impact Assessment (EIA) on a proposed investment: the framework environment law, that is the Law on Nature Protection and since 2011 the Law on Environmental Protection; and the Law on Ecological Expertise (No. 20, April 22, 2003, wording of laws No. 328, July 30, 2007; No. 468, December 31, 2008; and No. 589, January 12, 2010). In 2012, this law was replaced by the new Law on Ecological Expertise (No. 818, April 16, 2012).

Chapter V, Articles 35-39 of the Law on Environmental Protection (2011) introduces the concept of the State Ecological Expertise (SEE), a state environmental or ecological review that examines the compliance of proposed activities and/or projects with the requirements of the current environmental legislation and the standards and ecological safety of the society. SEE refers both to the department (institution) within the CEP as well as the process of review. These laws stipulate the mandatory cross-sectoral nature of the SEE that shall be scientifically justified, comprehensive, and objective, and lead to conclusions in accordance with the law. The SEE precedes decision making about any activity and/or investment that may have a negative impact on the environment.

Financing of programs and projects are allowed only after a positive SEE review has been issued. Activities and investments that are subject to SEE review also include the construction and refurbishment of various types of facilities (namely plants and factories, mines and deposits, industrial and dwelling buildings, production and service-related units, roads, railroads, airports, power transmission lines, and all other infrastructure) irrespective of their ownership. In short, all types of economic production activities must be implemented in accordance with existing environmental standards and norms and must have sufficient environmental protection and mitigation measures to prevent and avoid pollution and enhance environmental quality. The environmental assessment studies analyzing the short- and long-term environmental, genetic, economic, and demographic impacts and their consequences shall be evaluated prior to making decisions on the allocation, construction, or refurbishments of the facilities, irrespective of their ownership.² If these requirements are violated, construction will be stopped until the necessary improvements are made. These provisions are enforced by the Government of Tajikistan's duly authorized control bodies, including sanitary, geological, and public safety agencies.

An EIA is a component of the SEE, as set out in the 2011 Environmental Protection Law and in the 2012 Law on State Ecological Expertise. Conducting an EIA is the responsibility of the project proponent. The State Ecological Review (or State Environmental Review) comprises the process component only and, for all investment projects, is the responsibility of the CEP and its regional offices. Furthermore, according to the 2012 Law on State Ecological Expertise, all civil works, including rehabilitation, should be assessed for their environmental impacts and the proposed mitigation measures should be reviewed and monitored by the CEP.

The legal and regulatory system for the EIAs also include:

- the Procedure of Environmental Impact Assessment (adopted by the Resolution of the Government of the Republic of Tajikistan No. 509, August 1, 2014)
- the Procedure to Implement State Ecological Expertise (approved by the Resolution of the Government of the Republic of Tajikistan No. 697, December 3, 2012)

² The environmental assessment document must be prepared by the project proponent and submitted to SEE for review and further approval together with other relevant project documentation including background information and rationale, technical/engineering design, budget estimation, master or business plans, among others.

- guidelines on the composition, content, and structure of the documents to be submitted for review (SEE), including coordination and approval of all projected budget or investment estimations, design drawings, or documentation that must be developed in coordination with the SEE, buildings and structures and EIA chapters, Strategic Environmental Assessment, and feasibility documents
- the list of objects and types of activity for which preparation of documentation on EIA is mandatory (adopted by the resolution No. 253, June 3, 2013)

2.7 Main Environmental Laws

The main purpose of the legal environmental arrangements is to determine necessary standards and behavioral patterns of authorized agencies and citizens in order to live in a healthy and balanced environment. Regulations, directives, circulars, and notifications that were issued on the basis of the environmental laws include the procedures and methods to be complied with. A list of the main environmental laws by sector is provided here below.

Hydrometeorological Activities

Entered into force by Decree No. 86 (December 2, 2002), this law establishes the legal basis for hydrometeorological data gathering and analysis activities on hydrometeorology. It aims to meet the needs of the state, individuals, and legal entities concerning hydrometeorological information, as well as information about the state of the environment.

Production and Safe Handling of Pesticides

Entered into force by Decree No. 1 (April 22, 2003), this law establishes the legal basis of the production and safe handling of pesticides, including exposure to substances and agrochemicals to protect human health and the environment.

Protection and Use of Flora

Entered into force by Decree No. 31 (May 17, 2004), this law establishes the principles of state policy in the field of protection and rational use of the country's flora, including the legal, economic, and social framework in this subject matter, with the aim of preserving and reproducing flora resources.

Environmental Audit

Entered into force by Decree No. 785 (December 26, 2011), this law defines the principles and sequencing to conduct an ecological audit in the Republic of Tajikistan. The purpose is preventing any eventual harmful effect of economic and other production activities on the environment, life, and health of the population.

Environmental Information

Entered into force by Decree No. 705 (March 25, 2011), this law defines the legal, institutional, economic, and social framework for ensuring the production of environmental information in the Republic of Tajikistan. The law also promotes the rights of natural and legal persons to receive complete, accurate, and timely environmental information and regulates the relations in this area among all interested or concerned individuals, communities, or legal entities.

Environmental Monitoring

Entered into force by Decree No. 707 (March 25, 2011), this law defines the organizational, legal, economic, and social framework for environmental monitoring in the Republic of Tajikistan. It also governs the relationships between public authorities, local governments of towns and villages, public organizations, and citizens in this subject matter.

Environmental Education

Entered into force by Decree No. 673 (December 29, 2010), this law regulates the legal, organizational, financial, and economic principles of the state policy in the field of environmental education.

Atmospheric Air Protection

Entered into force by Decree No. 915 (December 28, 2012), this law regulates relations of individuals and legal entities, irrespective of their form of legal ownership, in order to preserve and restore air quality and ensure environmental safety.

Biological Safety

Entered into force by Decree No. 88 (March 1, 2005), this law regulates the development, testing, production, import, export, and placing on the market of genetically modified organisms, and aims to reduce the risk of their adverse effects on human health, national biodiversity, the ecological balance, and more generally on the environment.

Wildlife

Entered into force by Decree No. 354 (January 5, 2008), this law regulates social relations in the field of conservation, restoration, and rational use of wildlife. It also establishes the legal, economic, and social foundations for activities in this field which are aimed at the protection and restoration of wildlife resources.

Fish Breeding, Fishery, and Protection of Fish Resources

Entered into force by Decree No. 1021 (September 19, 2013), this law establishes the legal basis for conservation and sustainable use of fish resources, with the aim of providing the population with fish and fishery products. It also regulates fish breeding and the protection of fish habitat.

Specially Protected Natural Areas

Entered into force by Decree No. 786 (December 26, 2011), this law defines the legal, institutional, and economic framework for protected areas. The law also establishes the main responsibilities pertaining to the mode of operation and zoning in the country's protected areas.

Use of Renewable Energy

Entered into force by Decree No. 587 (January 12, 2012), this law regulates the legal relations arising between public authorities, individuals, and legal entities in the priority setting and efficient use of renewable energy sources. It also defines the legal and economic framework to ensure the improvement of energy efficiency, the reduction of the level of human impact on the environment and climate, as well as the economy and conservation of non-renewable energy sources for future generations.

Energy Conservation and Efficiency

Entered into force by Decree No. 1018 (September 19, 2013), this law regulates social relations with regards energy conservation and efficiency. It also determines in which order energy resources and products should be used.

Radioactive Waste Management

Entered into force by Decree No. 1002 (July 22, 2013), this law regulates the responsibilities of individuals and entities associated with radioactive waste management, so as to ensure the protection of people and the environment from the harmful effects of radioactive waste.

Potable Water and Drinking Water Supply

Entered into force by Decree No. 670 (December 29, 2010), this law establishes state guarantees for drinking water, and regulates its production and supply in the country.

Pastures

Entered into force by Decree No. 951 (March 19, 2013), this law regulates the use of pasture lands in the Republic of Tajikistan.

Food Safety

Entered into force by Decree No. 890 (August 1, 2012), this law regulates food production so that it be done in a way that protects human life and health, the interests of consumers, flora and fauna, and the overall environment in the Republic of Tajikistan.

Biological Management and Production

Entered into force by Presidential Decree No. 1001 (July 22, 2013), this law establishes the legal and institutional framework and management of production activities aimed at the production, processing, storage, transportation, packaging, labeling, and sale of biological products in the Republic of Tajikistan.

Ensuring Sanitary and Epidemiologic Safety of Population

Entered into force by Decree No. 49 (December 8, 2003, wording as of laws No. 441, October 6, 2008; No. 481 December 31, 2008; No. 793, December 26, 2011; and No. 1010, July 22, 2013), this law establishes the legal, organizational, and economic measures for ensuring the sanitary and epidemiological safety of the population of the Republic of Tajikistan.

Subsoils

Regulations on subsoils were approved by the Resolution of the Supreme Council of the Republic of Tajikistan No. 983 (July 20, 1994; wording as of laws No. 120, November 4, 1995; No. 351 January 5, 2008; No. 471, December 31, 2008; and No. 663 December 29, 2010). This resolution establishes the legal basis for study (observation), protection, and use of mineral resources.

Soils Conservation

Entered into force by Decree No. 555 (October 16, 2009), this act defines the basic principles of State policy in soil conservation, as well as the legal framework in which public authorities, individuals, and legal entities should operate for the rational and careful use of soil conservation quality, fertility, and soil protection against negative phenomena.

Protection of the Population and Territories from Emergency Situations of Natural and Manmade Origin

Entered into force by Decree No. 53 (July 15, 2004), this law determines the organizational and legal standards for the protection of the population in case of natural and/or manmade disasters and emergency situations affecting land, subsoil, water, air space, flora and fauna and other natural resources, industrial and social facilities, and the environment in general. It also establishes the responsibilities for preventing the cause of disasters, reducing the extent of damage and losses from emergencies, responding to emergencies, and providing timely warning to the population from emergency situations of natural and manmade origin.

Other important environmental legal acts include laws on

- energy saving (No. 524, February 6, 2002),
- hydro-meteorological activity (No. 86, December 2, 2002),
- production and safe handling of pesticides (No. 1, April 22, 2003),
- protection and use of flora (No. 31, May 17, 2004),
- protection of the population and territories from emergency situations of natural and manmade origin (No. 53, 15 July 2004),
- biological safety (No. 88, March 1, 2005),
- wildlife (No. 354, January 5, 2008),
- soils conservation (No. 555, October 16, 2009),

- subsoils (No. 983, July 20, 1994; wording as of laws No. 120, November 4, 1995; No. 351, January 5, 2008; No. 471, December 31, 2008; and No. 663, December 29, 2010),
- potable water and drinking water supply (No. 670, December 29, 2010),
- environmental education (No. 673, December 29, 2010),
- environmental information (No. 705, March 25, 2011),
- environmental monitoring (No. 707, March 25, 2011),
- environmental audit (No. 785, December 26, 2011),
- specially protected natural areas (No. 786, December 26, 2011),
- use of renewable energy sources (No. 857, January 12, 2012),
- food safety (No. 890, August 1, 2012),
- atmospheric air protection (No. 915, December 28, 2012),
- pastures (No. 951, March 19, 2013),
- biological management and production (No. 1001, July 22, 2013),
- radioactive waste management (No. 1002, July 22, 2013),
- ensuring sanitary and epidemiologic safety of population (No. 49, December 8, 2003; wording as of laws No. 441, October 6, 2008; No. 481, December 31, 2008; No. 793, December 26, 2011; and No. 1010, July 22, 2013),
- energy conservation and efficiency (No. 1018, September 19, 2013),
- fishing and protection of fishery resources (No. 1021, September 19, 2013).

3. National Sustainable Development Frameworks

Being a relatively small country with a relatively weak economy that relies mostly on agriculture and remittances of migrant laborers, Tajikistan is vulnerable to the loss of biodiversity, land degradation, and the negative impacts of climate change and pollution. To address these issues environmental considerations are being incorporated into plans and policies relevant to Tajikistan's national development agenda.

In 1997, the State Environmental Program of the Republic of Tajikistan (1998—2008) was adopted. This major public document that defined the main directions of sustainable development of society, and maintained a balance between natural resources and its users, the organization and coordination of relations between users of natural resources and nature, the healthy development of society, and the rational use of natural resources to restore the environment.

The 2002 *Poverty Reduction Strategy Paper* (Republic of Tajikistan 2002) ensured the National Development Strategy of the Republic of Tajikistan until 2015 was implemented according to the Millennium Development Goals (MDGs). The strategy represented a shared vision of the expected evolution in the midterm and contained the planned actions to implement economic reforms promoting Tajikistan's high sustained economic growth. The strategy mainly complemented future renewals, and ensured implementation of the country's development process that included improving the political climate, social welfare, and development of economic opportunities.

Tajikistan's National Biodiversity Strategy and Action Plan (NBSAP) was adopted by government decree No. 392 (September 1, 2003). It focuses on five strategic goals: economic and social evaluation of national biological resources; regeneration and conservation of the genetic pool of plants and animals; in situ and ex situ biodiversity conservation; provision of biological safety for the country; and sustainable use of biological resources to reduce poverty and improve the quality of human life. Fifteen priorities for biological conservation were identified, including the creation of the national ecological network and the conservation of each of Tajikistan's ecosystems, including through in situ and ex situ conservation, with key actions to implement each of these priorities. The NBSAP provides a set of measures aimed at reducing greenhouse gas (GHG) emissions improving the state of

their natural sinks, promoting climate change adaptation, optimization of systematic observation network, improved education, training and public awareness, as well as the preparation of the inventory of emission sources and sinks of GHGs. The NBSAP is being updated to cover the period until 2020.

The Concept of Transition to Sustainable Development of the Republic of Tajikistan (2007—30), approved by government resolution No. 500 (October 1, 2007), defines the vision, principles, goals, objectives, and key mechanisms for achieving sustainable development by integrating economic, environmental, and social issues aimed at improving the living standards of the population of Tajikistan.

The Concept of Environment Protection in the Republic of Tajikistan specifies the implementation of state policy in the field of environmental protection and natural resources use and management. It was approved by government Decree No. 645 on December 31, 2008.

The State Environmental Program 2009—19 provides an opportunity to resolve the issues of rational use of natural resources and the environment. It was approved by government resolution No. 123 (February 27, 2009).

The National Biosafety Framework (Republic of Tajikistan 2004) describes the mechanisms of cooperation among governmental institutions. It also ensures clarity, transparency, and predictability of decisions on biosafety. The framework describes the following components

- biosafety policy,
- regulatory framework,
- administrative system,
- monitoring and enforcement,
- public awareness and participation in decision making.

The 2001 Concept of Rational Use and Protection of Water Resources (government order No. 551, December 1, 2001) and the Concept of Land Use (government order No. 349, August 31, 2004) established policies regarding water resources and land use relations to ensure the sustainable development of the Tajik economy. They covered the following issues:

- The rational use and protection of water resources according to the principles of international water law
- Mutually beneficial and friendly cooperation with foreign countries
- General environmental security and international cooperation

The Program for the Improvement of the Security of the Republic of Tajikistan through Clean Drinking Water for 2008—20, approved by government order No. 514 (December 2, 2006), ensured the provision of funds to increase safe and clean drinking water.

The State Program on Development of Specially Protected Natural Areas in the Republic of Tajikistan for the period 2005—15 (government order No. 79, March 4, 2005) addressed major issues relating to conservation reserves and the management of protected areas. The program took into account the sustainable use of natural resources for ecotourism, recreation, and the creation of buffer zones around protected areas.

The Forestry Development Program of the Republic of Tajikistan for the period 2006—15 provides critical information for the forestry sector and the main guidelines in order to increase gross domestic product (GDP) and improve the environment. It was approved by Government Resolution No. 396 (October 31, 2005).

The 2001 Regional Environmental Action Plan for Central Asia, a technical assistance project executed by the Asian Development Bank (ADB), covered high priority transboundary environmental challenges common to countries in Central Asia. A common environmental and natural resources management vision for these countries was presented at the United Nations World Summit on Sustainable Development in Johannesburg (South Africa) in 2002 and the Europe Economic Commission Conference on Environment in Kiev (Ukraine) in 2003.

The National Environmental Action Plan was approved by the Government of Tajikistan in 2006 . Its main purpose was to create a basis to optimize environmental management and conservation of the most fragile and valuable ecosystems for harmonious ecological and economic development. Sectoral strategies were developed on the main priorities of the plan.

The National Action Plan for Environmental Hygiene presented the national environmental and health management policy for living in a favorable environment, both socially and physically. It was adopted by the Ministry of Nature Protection and the Ministry of Health in 1999.

The National Program of Action to Combat Desertification was approved in 2001. It provided a set of measures to protect and improve the status of forest and land resources and included measures to react to climate change caused by carbon fixation.

The national program to eliminate the use of ozone-depleting substances (ODS) and the government's subsequent Action Plan determined the timing to phase-out use of ODS with a complete rejection of use related to Annex A Group 1 and Group II of Annex B of the Montreal Protocol by January 1, 2004.

The Targeted Comprehensive Program for the Use of Renewable Energy Sources in Tajikistan for 2007—15 was adopted by the government in 2007. The program provided a set of measures to introduce and facilitate the use of renewable energy sources including solar radiation, wind energy, biomass, small rivers hydropower plants, and geothermal sources.

The National Action Plan on Persistent Organic Pollutants (POPs), developed in 2007, provided guidelines for implementation of the Stockholm Convention in Tajikistan.

The State Comprehensive Program for Environmental Education, adopted by Decree No. 178 of April 2, 2015, includes the long-term goals, objectives, and priorities to improve environmental education at all levels.

4. National Institutions Involved in the Environment Sector

To create an effective system of governance, strategic planning, and sustainable socioeconomic development of the country, and in accordance with Article 69 of the constitution, various state agencies and institutions are involved in the environmental institutional and management system of Tajikistan. These include

- Parliament,
- the presidential administration,
- the CEP,
- the State Committee of Statistics,
- the Ministry of Agriculture,
- the Ministry of Energy and Water Resources,
- the Ministry of Healthcare,
- the Ministry of Economic Development and Trade,
- the Ministry of Finance,
- the Agency for Land Reclamation and Irrigation,
- the Tajik Standard Agency,
- the Tajik Forestry Agency,
- the Tajik Meteorological Service under CEP,
- the Tajik Academy of Science and its research institutes,
- the Tajik Academy of Agricultural Science and its research institutes,
- other minor institutions.

The Environmental Protection Agency (EPA) of Tajikistan (also called the Committee for Nature Protection of the Tajik Soviet Socialistic Republic) was established for the first time in August 1989. Its mandate included coordination of activities related to environmental protection among government agencies and control over natural resource use, land protection, subsoil, forests, water, and other resources. In 1994, EPA's legal status was

improved and reorganized into the Ministry of Nature Protection of the Republic of Tajikistan with the same mandate. However, 10 years later, due to restructuring of the Government of Tajikistan, the ministry became the State Committee for Environmental Protection and Forestry (SCEPF) in 2004. The SCEPF's mandate was expanded slightly to include the former forestry management agency. In 2006, due to further governmental restructuring, the SCEPF was merged with the Ministry of Agriculture to become the Ministry of Agriculture and Environmental Protection whose mandate within the new Ministry was kept the same. In 2008, the SCEPF became the CEP under the Government of the Republic of Tajikistan.

The CEP coordinates all activities relating to environmental protection among Government of Tajikistan ministries and oversees natural resources use, land protection, subsoil, forests, water, and other resources. The decisions of the CEP are considered mandatory for all legal entities and individuals. Currently, the CEP has a total of 400 staff of which about 50 are in headquarters in Dushanbe.

The CEP manages a website and publishes an environmental journal, a government newsletter, and the annual report on the state of the environment. In addition, the CEP produces a monthly video for television on a selected environmental and climate change issues. The CEP oversees Hydromet, the Tajik meteorological service and other institutions that work in the area of environmental information, analytical and instrumental control, ecotourism, nature and water conservation, and climate change studies. The CEP also manages its own information center (Aarhus Center), a training center, and laboratory facilities. The CEP's current role relating to environmental safeguards policy include increased involvement in policymaking for sectors that may pose threats to the environment, a clear mandate for coordination with other ministries in cross-cutting areas such as environmental education, and training on climate change and mainstreaming adaptation into policies and programs.

The parliament of Tajikistan plays a key role in determining policies, strategies, and rules for sectors that may affect and be affected by environmental factors. It consists of a lower and higher chamber. Parliament involves relevant executive agencies dealing with environmental safeguards and overseeing relevant sectoral legislation.

Several committees are of particular relevance:

- The Ecological Committee oversees environment-related legislation.
- The Education Committee oversees the Law on Environmental Education and laws regarding post-secondary education and professional (vocational) training.
- Sectoral committees covering environment-sensitive sectors, such as the Agriculture Committee, are essential for integrating environmental safeguards issues into agriculture, land use, water, and other policies.

Parliament has an information library for members of the Lower Chamber that contains more than 16,500 publications. Among 63 parliamentarians, six are members of the Ecological Committee that works directly on environment-related legislation.

The Ministry of Economic Development and Trade is the government agency tasked with overseeing the system of state economic planning and forecasting, and facilitating the effective implementation of socioeconomic development priorities in Tajikistan. One of the main tasks of the ministry is to develop and implement Tajikistan's economic development programs and strategies with the aim of reducing poverty and stabilizing socioeconomic conditions. According to governmental regulations, the Ministry of Economy participates in all working groups that develop sustainable strategies, plans, and budgets. Representatives of the ministry lead the group preparing the country's national development and poverty reduction strategies. The ministry also monitors the implementation of the two strategies. The ministry is also one of the co-executive bodies of the National Action Plan for Climate Change Mitigation.

The Ministry of Finance, aside from its economic and financial functions, is responsible for reviewing and approving the budgets of state agencies including those related to the environment and climate change.

The Ministry of Industry and Innovative Technology is involved with environmental issues despite its role as the Designated National Authority for Clean Development Mechanism under the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC). The ministry is responsible for data flow coordination, monitoring, and analysis under the national development strategy process.

The Ministry of Energy and Water Resources is responsible for the national water policy. It is involved in almost all emerging policies in the country, including the discussion of program action plans focusing on environmental protection. The ministry is participating in the development of the national water strategy based on the MDGs. The strategy includes the development of energy sources without negative environmental impact. The activities of the ministry are interlinked with the construction of hydropower plants and their reservoirs and it gives consideration to the trade-off between development and environmental issues with the strategic purpose of: providing the necessary flow regulation during fluctuation and changes in water volume; reducing the negative impacts of silt on existing reservoirs; and reducing the potential negative impacts when constructing new reservoirs.

The Ministry of Agriculture develops and coordinates agricultural and regional policy, strategic plans, and state and sectoral programs in the agricultural sector. It also oversees a significant segment of the economy that is vulnerable to climate change, land degradation, POPs, biodiversity, and other GEF focal areas. The ministry has a total of 3,583 staff, 104 of whom work in the central management unit in Dushanbe.

The ministry also oversees the activities of the Academy of Agricultural Sciences that serves as the scientific and coordination center for agrarian science in Tajikistan. It is also linked with the Tajik Agrarian University which has nine faculties. Both of these provide opportunities for applied research and knowledge transfer. The ministry also publishes the journal *Kishovarz*. The Agrarian University publishes the monthly newspaper, *Donish*. The activities of the Academy of Agricultural Sciences are directly relevant to various environmental issues.

According to public health law, the Ministry of Health provides sanitary-epidemiological services to the public. It supervises the state sanitation-epidemiological services; conducts activities on environmental safety, environmental protection, and sanitation; and develops national industry health norms, regulations, and hygiene standards. The ministry has an affiliated research institute, the Institute of Epidemiology and Sanitation, and manages about 73 sanitary-epidemiological observation stations. The State Epidemiological Service is an independent agency participating in a World Health Organization (WHO) regional project on health and climate change. The project team has drafted a Strategy for Health and Climate Change.

The Ministry of Education is mandated, under the Law on Environmental Education, to develop and carry out environmental education projects. The ministry oversees schools through which they raise awareness about climate change issues.

The Post-Graduate Institute of Continuing Education for Civil Servants, which falls under the jurisdiction of the Ministry of Education, is engaged in the ongoing preparation and retraining of civil servants ranging from the heads of jamoats (district-level officials) to senior management staff in all government ministries and departments. In 2010, the institute developed three training modules on the three Rio Conventions (UNFCCC, the United Nations Convention on Biodiversity [CBD], the United Nations Convention to Combat Desertification [UNCCD]), and it expects to deliver 20 trainings on climate change for civil servants in the main oblasts of Tajikistan. It is also planning to establish a Department of Environmental Education. The institute has also conducted a special course on human development that included modules on environmental security and gender equality.

The Ministry of Transport is responsible for implementation of transportation policy, the environmental impact of the transport infrastructure, and transport traffic. It also responsible for examining the impact of climate change on road infrastructure, for example roads and bridges washed away by mudflows and avalanches. The ministry is also participating in the development of a National Strategy for Sustainable Transport, giving it a mandate to focus on environmental issues.

The State Committee for Land Use, Geodesy, and Cartography was established in 2011 and is responsible for developing land use policies and reforms. It is one of the main agencies responsible for the development of the land code. The committee's functions include

- monitoring of land resources,
- ensuring efficient use and conservation of land,
- introducing a land inventory,
- state registration of legal land use,
- promoting rational ways of land use,

- defining land tax and land use fees for violation of land legislation,
- participating in decision making regarding the rehabilitation of degraded land,
- preparing documents for the distribution of land among various executive agencies.

In addition, the committee oversees two institutes that conduct applied research relating to land use change, including land use inventories and mapping. The committee has a main office in Dushanbe with approximately 70 staff and district level offices with nearly 200 staff.

The Committee for Emergency Situations and Civil Defense is the government agency tasked with disaster risk reduction and response and coverage of climate-induced natural disasters. The Committee conducts reviews and analysis of disaster risk assessment in light of climate change, and has a department that focuses on evacuation and resettlement. In terms of facilities, the Committee's headquarters are in Dushanbe, and it has representatives in every region and district of the country. The committee has its own training facilities and offers in-service training for its employees. It also has its own chemical-radiometric laboratory. It participates in several initiatives across the Commonwealth of Independent States (CIS) to share good practice, and has previously used international experts on an extended-term basis through technical assistance projects with good results.

The Agency of Land Reclamation and Irrigation is responsible for sustainable operation of the national irrigation system and the land reclamation. The agency is responsible for the distribution of water to farmers for agricultural purposes, so monitors the use of water resources and provides data on water consumption to the CEP. It is also in charge of the operation and maintenance of irrigation and rural water supply infrastructure. It has offices in Dushanbe and also oversees the Institute of Water Improvement.

The Academy of Sciences is the main source for scientific information and data by highly-qualified specialists and researchers. Fifteen research institutes including the Institute of Water Problems, Hydropower, and Ecology operate under the umbrella of the academy. The academy has the capacity to develop long-term action plans in different sectors of the economy, and its researchers are involved in developing the National Action Plans on biodiversity and climate change mitigation. The academy includes institutes that conduct research related to the environment (climatology, glaciology, hydrology, radiation safety, hydropower, biodiversity conservation, and water resource management). Fourteen of the institutes are located in Dushanbe, and one is located in the Gorno-Badakhshan Autonomous Oblast. The academy issues several publications including *Izvestiya*.

5. International Environmental Commitments

Tajikistan's current policy pays particular attention to international cooperation on environmental issues. The country has been actively involved in the international agreements and conventions. Presently, the Government of Tajikistan is a member of the following international organizations:

- The United Nations and its agencies such as the United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), the United Nations Economic Commission for Europe (UNECE), among many others
- The World Trade Organization (WTO)
- The Organization for Security and Co-operation in Europe (OSCE)
- The Shanghai Cooperation Organization (SCO)
- The CIS

Key global, regional, and subregional international agreements approved, ratified, acceded, and/or adopted by Tajikistan include:

- The United Nations Educational, Scientific and Cultural Organization (UNESCO) Convention Concerning the Protection of the World Cultural and Natural Heritage, adopted August 28, 1992.
- The Vienna Convention for the Protection of the Ozone Layer, acceded on May 6, 1996 and updated on May 7, 2009 (Beijing Amendments). The scope of this convention is to take appropriate measures in accordance with its provisions and protocols to protect human health and the environment against

adverse effects resulting or likely to result from human activities that modify or are likely to modify the ozone layer.

- The CBD, acceded on October 29, 1997. This multilateral environmental agreement has three main goals: conservation of biological diversity; sustainable use of its components; and fair and equitable sharing of benefits arising from genetic resources. Related updates include:
 - The Cartagena Protocol on Biosafety to the CBD, acceded on February 12, 2004
 - The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the CBD. It was signed on September 20, 2011 and ratified on September 12, 2013
- The UNCCD, acceded on July 16, 1997. This multilateral environmental agreement aims to combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.
- The UNFCCC, adopted on July 16, 1997 and entered into force on October 14, 1997. This international environmental treaty was negotiated at the United Nations Conference on Environment and Development (UNCED), informally known as the Earth Summit, held in Rio de Janeiro from June 3-14, 1992. The objective of the treaty was to stabilize GHG concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The Kyoto Protocol, acceded on December 29, 2008 and entered into force on March 29, 2009, extended the UNFCCC.
- The UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention 1998), acceded on July 17, 2001. This multilateral environmental agreement facilitated the opportunities for citizens to access transparent environment-related information. The convention enhanced the environmental governance network, introducing a reactive and trustworthy relationship between civil society and governments. The value of public participation in the decision-making process is empowered by the convention that guarantees access to justice in the environmental issues. The related update is the Kiev Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information (May 21, 2003).
- The Convention on Wetlands (Ramsar Convention), entered into force in Tajikistan on November 18, 2001. It is an international treaty for the conservation and sustainable use of wetlands, that is to stem the progressive loss of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value.
- The UNEP Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention), acceded in 2000. This environmental treaty provided a global platform for the conservation and protection of migratory animals and their habitats under the aegis of UNEP. A related update is the Bukhara Deer Memorandum (2002).
- The Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD), acceded on October 12, 1999. This international treaty prohibited military or other hostile use of environmental modification techniques with widespread, long-lasting, or severe effects.
- The Stockholm Convention on Persistent Organic Pollutants, signed on May 21, 2002 and ratified on February 8, 2007. This international environmental treaty aimed to eliminate or restrict the production and use of POPs. Related updates include:
 - 2009 amendments listing nine new POPs (August 26, 2010)
 - 2011 amendment listing endosulfan (October 27, 2012)
 - 2013 amendment listing hexabromocyclododecane (HBCD) (November 26, 2014)
- The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, signed on September 28, 1998, but not yet ratified. This multilateral treaty promotes shared responsibilities for the importation of hazardous chemicals. It also promotes an open exchange of information and calls on exporters of hazardous chemicals to use proper labeling, include directions on safe handling, and inform purchasers of any known restrictions or bans.

This review justifies that the environmental legal framework of Tajikistan and its policies are in parallel with the international environmental agenda context. Table 1 lists the international environmental conventions and treaties acceded by the Government of Tajikistan.

Table A.1 Environmental International Conventions and Regulations Accessed/Ratified by Tajikistan

#	Convention/Agreement	Year ³
1	Convention of the World Meteorological Organization	1991
2	Rio Declaration on Environment and Development	1992
3	The United Nations Convention on Biological Diversity	1997
	Cartagena Protocol on Biosafety (CBD)	2004
	Nagoya Protocol on Access and Benefit-sharing (CBD)	2013
4	Vienna Convention for the Protection of the Ozone Layer	1996
	The Protocol on Substances That Deplete the Ozone Layer (Montreal)	1998
	London Amendments to the Montreal Protocol on ODS	1998
	Copenhagen Amendments to the Montreal Protocol on ODS	2009
	Montreal Amendments to the Montreal Protocol on ODS	2009
	Beijing Amendments to the Montreal Protocol on ODS	2009
5	UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention 1998)	2001
	Protocol on Pollutant Release and Transfer Registers	2003
6	United Nations Convention to Combat Desertification (UNCCD)	1997
7	United Nations Framework Convention on Climate Change	1997
	Kyoto Protocol	2009
8	Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar Convention)	2001
9	Bonn Convention on the Protection of Migrating Wild Animals (CMS)	2000
	Bukhara Deer Memorandum (CMS)	2002
10	Stockholm Convention on Persistent Organic Pollutants	2007
	2009 amendments listing nine new POPs	2010
	2011 amendment listing endosulfan	2012
	2013 amendment listing hexabromocyclododecane	2014
11	Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD)	1999
12	Framework Convention for the Protection of the Environment for Sustainable Development in Central Asia	2006
13	Agreement on Cooperation in the field of ecology and environmental protection	1992
14	Agreement on Cooperation for Environmental Monitoring among the CIS countries	2001

In the framework of regional and subregional cooperation, Tajikistan actively participated in the Environment for Europe process that started in 1991. Tajikistan was active in the third, fourth, and fifth ministerial conferences in Sofia (Bulgaria) in 1995; Aarhus (Denmark) in 1998; and Kiev (Ukraine) in 2003 respectively.

³ Year refers to ratification/acceptance or accession/succession.

Tajikistan participated in the Pan-European Biological and Landscape Diversity Strategy and the Task Force for the Implementation of the Environmental Action Programme, established during the second Environment for Europe Conference in Lucerne (Switzerland).

At the 2003 Kiev ministerial conference, Tajikistan and the other four Central Asian states presented an Invitation to Partnership for the Central Asian Sustainable Development Initiative Implementation. It highlighted the geopolitical importance of Central Asia in the UNECE region for the maintenance and enhancement of security, and preservation of a wholesome and healthy environment including the conservation of landscape and biological diversity.

The five states suggested a multilateral agreement to jointly tackle the problems of the environment, water, and security with donors, civil society, and private businesses. The proposal for a regional agreement was also reflected in the Central Asia progress review on the implementation of Agenda 21 and the statement by Interstate Commission on Sustainable Development⁴ at the World Summit on Sustainable Development.

CIS countries entered into the Agreement on Cooperation in the Field of Ecology and Environmental Protection (CIS agreement) on February 8, 1992. It creates the legal basis for cooperation in the field of environmental protection among the CIS countries.

The Cooperation Agreement for Environmental Monitoring between CIS countries was made in 2001 as a legal basis for cooperation in the field of environmental monitoring for CIS countries.

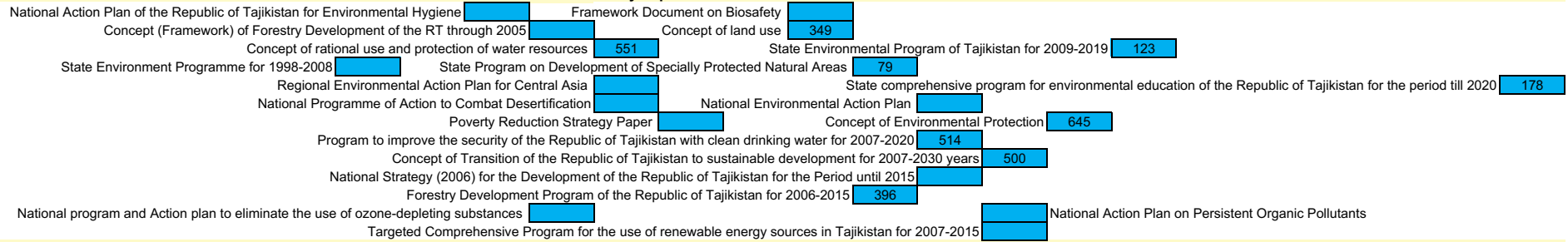
The Framework Convention for the Protection of the Environment for Sustainable Development in Central Asia was adopted by Presidential Decree No. 1828 (November 10, 2006). The convention pursues regional cooperation to preserve the unique environment of Central Asia and the sustainable use of its natural resources.

The timeline in figure 1 illustrates the sequences between the timing of laws/regulations, the ratification of treaties and the implementation of GEF projects.

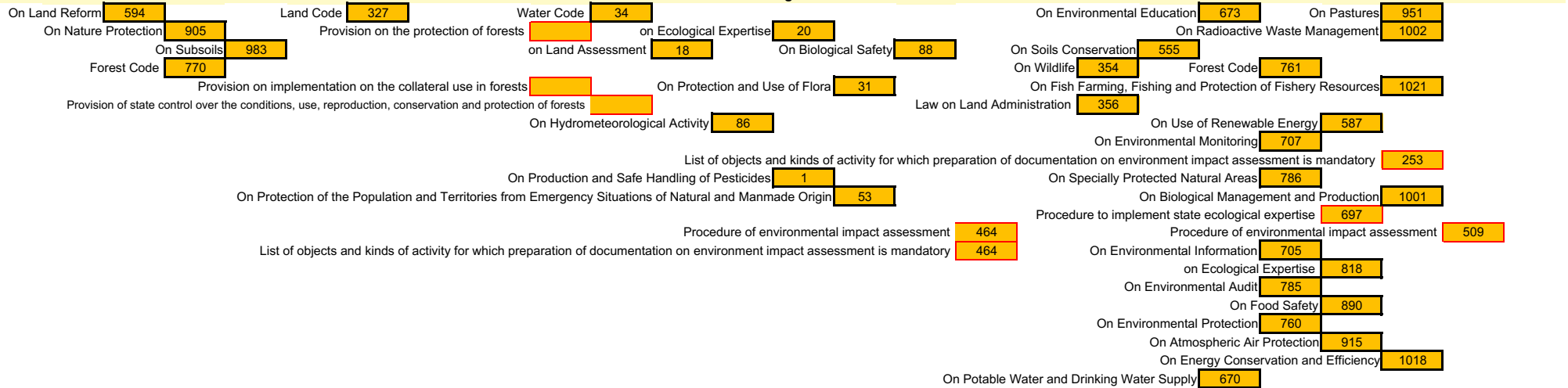
⁴ The Interstate Commission on Sustainable Development is a forum originally established by the five Central Asian countries to prepare their national sustainable development reports for the World Summit on Sustainable Development in Johannesburg (South Africa) in 2002. It began its work in 2000.

Year: 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

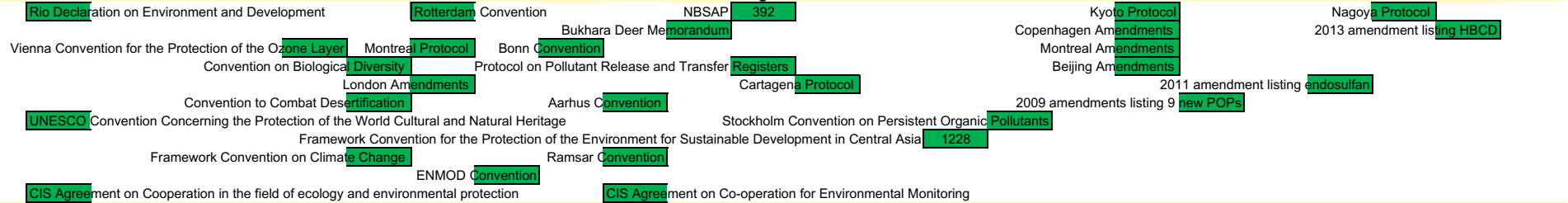
National Policy Papers and Documents



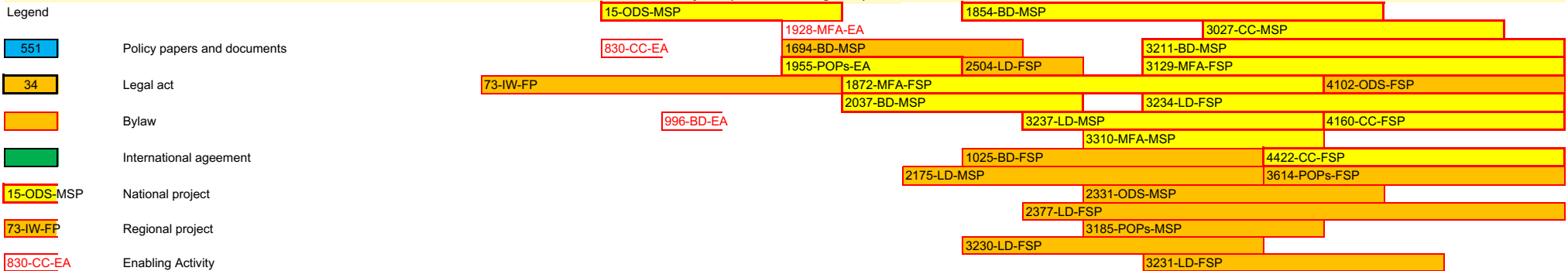
National Laws and Regulations



International Treaties and Agreements



GEG Projects (National & Regional)



6. Implementation Status and Challenges

Tajikistan recognizes the importance of its biodiversity and other natural resources and the significance of the threats to their sustainable management, which include a variety of unsustainable land and natural resource practices that might impact its fragile ecosystems. These challenges are being addressed through the development and implementation of relevant legislation and action plans such as the National Environmental Action Plan that was prepared with the involvement of government ministries, committees, agencies and other authorities, local government (hukumats), the private sector, and civil society and community-based organizations.

Environmental Regulations

The purpose of regulatory arrangements in the environmental area is to determine necessary standards and behavioral patterns of authorized agencies and citizens in order to live in a healthy and balanced environment. Regulations, directives, circulars, and notifications that were issued on the basis of the environmental laws include the procedures and methods to be complied with.

Public Participation and Gender

Article 12 of the Environment Protection Law proclaims the right of citizens to live in a favorable environment and to be protected from negative environmental impacts. Citizens also have the right to access environmental information, as well as the duty to adopt and implement decisions related to environmental impacts (Article 13). The latter is ensured by public discussion of drafts of environmentally important decisions and public ecological reviews. Public representative bodies have an obligation to take into consideration citizens' comments and suggestions. On July 17, 2001 Tajikistan acceded to the 1998 Aarhus Convention, whose provisions have priority over domestic law with regard to gender equality.

Licenses

Licenses are legal instruments to regulate certain potentially hazardous activities where minimal qualifications and strict adherence to rules are required to ensure that they are carried out efficiently, safely, and do not result in potentially significant or irreparable damage to the environment and human health. In particular, licenses issued by the relevant sector authorities are required for handling hazardous waste and activities in industrial safety.

Environmental Permits

Environmental permits are meant to ensure the sustainable use of natural resources. There are two types of permits: permits to use natural resources and permits for emissions or discharges. The natural resource permits allow their holders to take a certain number or amount of a particular natural resource within a defined territory and time period. They are issued both to individuals (for example to hunt a particular species of animal or harvest particular factories) and to organizations (for example permits to extract ground or surface water for a particular use). By law, permits are needed for any commercial use of any resource. Permits to discharge polluted matter are issued by the relevant inspectorate (for example previous State Water Inspectorate or State Air Inspectorate – now departments) of the local state environmental protection committees to industrial or agricultural enterprises and municipal utilities that release by-products into the environment. Permits allow releasing a certain amount of polluted matter (gases, liquids, solid waste) into the environment. They are usually granted for one year and indicate the maximum allowed concentration of pollutants in the released matter, the maximum volume of polluted matter, and the pollutants allowed.

Environmental Norms and Standards

Environmental norms and standards are set for air and water pollution, noise, vibration, magnetic fields, and other physical factors, as well as residual traces of chemicals and biologically harmful microbes in food. Exceeding these thresholds results in administrative action, including financial sanctions. Several ministries determine environmental quality standards, each in its field of responsibility. For example, admissible levels of noise, vibration, magnetic fields, and other physical factors have been set by the Ministry of Health.

Enforcement Instruments

A number of legal acts establish liability for violations of environmental laws that are enforced by several state bodies and agencies. In particular, the 2010 Code of Administrative Violations establishes administrative liability for organizations and individuals according to a range of violations, from the careless treatment of land, to violation of the rules for water use or water protection, or failure to comply with a state ecological expertise. The administrative sanctions for environment related violations can be imposed by the administrative commissions of *hukumats*, courts, CEP inspectors, veterinary inspectors from the Ministry of Agriculture, and the State Committee for Land Use, Geodesy, and Cartography. The most common administrative sanction is a fine of up to 10 months salary for individuals and up to the equivalent of 15 employee's salaries for organizations. Since 1998, the Criminal Code deals with crimes against ecological safety and the environment, such as violations of ecological safety at work, poaching, spoiling land, and violations of rules for the protection and use of underground resources. The maximum fine is up to two minimal monthly salaries and the maximum sentence is up to eight years in prison.

Implementation Status by GEF Focal Area

Biodiversity

Tajikistan acceded to the CBD on October 29, 1997 and the follow up Cartagena Protocol on Biosafety on February 12, 2004. Further, in 2000, the country joined other biodiversity-related conventions including the Ramsar and Bonn Conventions (entered into force for Tajikistan in 2001). The Russian Federation represents Tajikistan's interests at meetings on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), since Tajikistan has not yet acceded to it.

In 1997, the State Environmental Program of the Republic of Tajikistan for 1998—2008 was adopted. The program is a major public document defining the main guidelines of sustainable development of society, how to maintain a balance between natural resources and its users, the organization and coordination of relations between users of natural resources and the nature, the healthy development of the society, and the rational use of natural resources as the right way to restore the environment. The current Environmental Program of the Republic of Tajikistan for 2009—19 provides an opportunity to resolve the issues of rational use of natural resources and the environment.

In 2001, the Regional Environmental Action Plan for Central Asia was developed under the auspices of the Intergovernmental Sustainable Development Commission and with support from ADB, UNEP, and UNDP. It has five basic ecological priorities: air pollution, water pollution, land degradation, waste management, and mountain ecosystems degradation. Each of the five Central Asian States has the lead for one of these priorities. Tajikistan has the lead for mountain ecosystems degradation. The action plan identified both short-term (2002—07) and long-term measures (2007—12) for each of the five issues as well as for public involvement.

Currently, the Tajik authorities are becoming increasingly aware of both the importance of biodiversity and the significant threats to its sustainable management that include a variety of unsustainable land and natural

resource practices that are increasingly impacting ecosystems. Under its obligations to the CBD, Tajikistan prepared its NBSAP in 2003 with the support of the GEF.

Tajikistan also joined the Cartagena Protocol on Biosafety in February 12, 2004. This was supported by the UNEP/GEF project on the development of National Biosafety Framework in 2004. The project showed that the legislation was not sufficient for the implementation of the protocol and the need for a new biosafety law arose. A task force was established to prepare a draft law on biosafety and in 2005, the Law on Biological Safety was approved by Decree No. 88 (March 1, 2005).

The challenges above were also considered by the 2006 National Environmental Action Plan by governmental agencies, academia, and civil society.

The Concept of Transition of the Republic of Tajikistan to Sustainable Development for 2007—30 was approved by the government in 2007. It defines the vision, principles, goals, objectives, and key mechanisms for achieving sustainable development by integrating economic, environmental, and social issues aimed at improving the living standards of the population of Tajikistan.

In 2008, Tajikistan adopted the Concept of Environmental Protection. It provides the basis for the implementation of state policy in the field of environmental protection and natural resources use and management.

Climate Change

Tajikistan became a party to the UNFCCC on July 16, 1997 and it entered into force on October 14, 1997. The government adopted its National Action Plan for the Mitigation of Climate Change in 2003 and on December 29, 2008, it joined the Kyoto Protocol, which was introduced into the legislation on March 29, 2009.

The First National Communication on Climate Change was published in 2002 with the financial support from the GEF and UNDP. This communication became the national strategic document to provide capacity building in priority areas. With the support mentioned above, the National Action Plan for Climate Change Mitigation was elaborated in 2003. Second and Third National Communications on Climate Change were submitted on December 31, 2008, and December 29, 2014 respectively.

A significant contribution to the preparation of the national Greenhouse Gas Inventory (GHG) was made through regular consultations and close cooperation with experts from the National Communication Support Program of GEF-UNDP, the UNFCCC Secretariat, the Azerbaijan Climate Change Center, among others.

Within the framework of the UNFCCC and Kyoto Protocol, Tajikistan is committed to using clean and highly efficient resources in all new infrastructure, buildings, and industrial plants. GEF support to Tajikistan with regards to climate change is in line with the country's specific development plans and policies. The Kyoto Protocol provides a framework to accede to international investments through the Clean Development Mechanism and a GEF-funded project focused on issues relating to the this mechanism.

In 2007, the Government of Tajikistan adopted the Targeted Comprehensive Program for the Use of Renewable Energy Sources in Tajikistan for 2007—15. It provides a set of measures to create a production base and infrastructure for the use of renewable energy sources including solar radiation, wind energy, biomass, small rivers flow, and geothermal sources.

The Government of Tajikistan elaborated and adopted the Decree on the Use of Renewable Energy No. 587 on January 12, 2012. The decree regulates the legal relations between public authorities, individuals, and legal entities concerning the efficient use of renewable energy sources, and defines the legal and economic framework to ensure improvements in energy efficiency, and reducing the level of human impact on the environment and climate.

Decree No. 1018 on Energy Conservation and Efficiency further improved national legislation and was adopted by the government on September 19, 2013. The decree regulates social relations in the field of energy conservation and determines the order of efficient use of energy resources and products.

International Waters

GEF national and regional activities in Tajikistan cover projects in ODS, biodiversity, international waters, and land degradation. For example, the GEF fully supported the regional Water and Environmental Management in the Aral Sea Basin (GEF ID 73) project at a cost of more than \$21.5 million.

The Water Code of the Republic of Tajikistan was developed and adopted in 2000. This legal act stipulates the policies on water management, permissions, dispute resolution, usage planning, and cadaster. It promotes rational use and protection of water resources and defines types of water use rights, as well as the authority and roles of regional and local governments for water allocations among various users and the collection of fees. In 2001, Tajikistan adopted the Concept of Rational Use and Protection of Water Resources that established a water policy to ensure sustainable economic development through the rational use and protection of water resources based on the principles of international water law and international cooperation.

The Law of the Republic of Tajikistan on Potable Water and Drinking Water Supply was entered into force by Decree No. 670 on December 29, 2010. This law regulates the supply of drinking water and establishes related quality standards.

Land Degradation and Sustainable Forest Management

Tajikistan became a party to the UNCCD on July 16, 1997. The GEF supports the implementation of the UNCCD through its land degradation and sustainable forest management focused projects. It also fosters synergic benefits with the UNFCCC, the CBD, and international agreements on the sustainable use of waters.

In 2000, Tajikistan adopted the Concept (Framework) of Forestry Development and, in 2001, it finalized the National Action Program for Combating Desertification. The program analyses the threats of desertification and land degradation, the contributing factors, and the environmental, economic, and social consequences. A strategy to combat desertification recommends, inter alia, monitoring the desertification process and creating an information system on desertification problems classifying the territory according to the degree of soil degradation. The program takes into consideration antierosion methods for combating soil degradation and sustainable use of natural resources. The program also develops social and economic instruments for action against desertification.

In 2005, the government adopted the Concept of Land Use in 2004 and the Forestry Development Program for 2006—15.

Complementary to the National Action Program for Combating Desertification and the Forestry Development Program, the GEF contributed to fund several national and regional initiatives (two medium-size projects [MSP] and five full-size projects [FSP] in the area of land degradation, as well as one multifocal MSP and two multifocal FSPs) that address the problems of rural poverty and land degradation in different regions of the country. Since 2009, the GEF has contributed funds to prevent land degradation through several projects funded through the GEF/UNDP Tajikistan Small Grant Program (SGP). Through the Tajikistan SGP, community-based and nongovernmental organizations are directly funded in view of the key role they play in environment protection and sustainable development.

Chemicals and Waste

Tajikistan signed the 2001 Stockholm Convention on POPs on May 21, 2002 and it was ratified by parliament on February 8, 2007. It is an international environmental treaty that aims to eliminate or restrict the production

and use of POPs. Tajikistan joined the new amendments in 2009 that listed nine new POPs on August 26, 2010; the 2011 amendment listing endosulfan on October 27, 2012; and the 2013 amendment listing hexabromocyclododecane (HBCD) on November 26, 2014.

In response to the requirements, and in accordance with its rules and procedures, Tajikistan was obliged to develop and implement a National Implementation Plan (NIP). This task was supported by the GEF through the Enabling Activities for the Stockholm Convention on Persistent Organic Pollutants project (GEF ID 1955). Developed and adopted in 2005, the plan provides a basic and essential level of information to enable policy and strategic decisions by identifying activities to be undertaken in order to meet the requirements of the Stockholm Convention.

The Law of the Republic of Tajikistan on Ensuring Sanitary and Epidemiologic Safety of the Population was entered into force by the Decree No. 49 on December 8, 2003 (wording as of laws No. 441, October 6, 2008; No. 481, December 31, 2008; No. 793, December 26, 2011; and No. 1010, July 22, 2013). The law establishes legal, organizational, economic basis, measures, to ensuring the sanitary and epidemiologic safety of the Tajik population.

The Law of the Republic of Tajikistan on Radioactive Waste Management entered into force by Decree No. 1002 (July 22, 2013). This law regulates the activities of individuals and entities associated with radioactive waste management, as well as ensuring the protection of people and the environment from the harmful effects of radioactive waste.

Currently Tajikistan is considering joining the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Disposal.

Despite progress to align the country's environmental framework, several legislations on air, water, and nature protection still need to be regulated and several standards are not consistent with best international practices.

Challenges

Tajikistan faces a number of challenges in implementing environmental legislations because:

- The allocation of environmental responsibilities among government institutions is not clear enough.
- The government has not mobilized sufficient financial resources for investment in environmental issues.
- The use of a variety of economic instruments for environmental purposes (including specific taxes, charges, emission trading systems) in Tajikistan is not considered as one of the most relevant tools to meeting the required efficiency.
- Environmental management systems for industry development including public-private partnership are adopted but not implemented.
- Provincial and local authorities do not have the capacity to ensure environmental safeguards.
- The application of the principles where polluters pay and users pay is not effectively implemented through a shared approach.

Annex A.1. References

Asian Development Bank (ADB). 2014. *Improving the Implementation of Environmental Safeguards in Central and West Asia: Legal and Regulatory Framework for Environmental Protection in Tajikistan*.

United Nations. 2003. *Moving Mountains. A United Nations Assessment of Development Challenges in Tajikistan*. www.unece.org/fileadmin/DAM/hlm/prgm/cph/experts/tajikistan/Documents/UNDP.cca.pdf.

United Nations Economic Commission for Europe (UNECE). 2012. *2nd Environmental Performance Review of Tajikistan*. ECE/CEP/163. www.unece.org/environmental-policy/environmental-performance-reviews/enveprpublications/environmental-performance-reviews/2012/2nd-environmental-performance-review-of-tajikistan/docs.html.

_____. 2010. *Review of Legislation on Environmental Impact Assessment of the Republic of Tajikistan With Regard to Introduction and Implementation of the Espoo Convention*. https://www.unece.org/fileadmin/DAM/env/eia/documents/Events/DushanbeJul10/Review_EIA_legislation_Tajikistan_en.pdf.

United Nations Environment Programme and the GEF. 2007. *Sustainable Land Use in High-mountains of Pamir and Pamir-Alai (PALM) and Integrated Trans-boundary Initiative in Central Asia: Improvement of Legal and Regulatory Framework for Sustainable Land Management (SLM) Project Document*. <https://www.thegef.org/project/sustainable-land-management-high-pamir-and-pamir-alai-mountains-and-integrated-and>.

Laws and codes

Constitution of the Republic of Tajikistan, 1994

Forest Code of the Republic of Tajikistan, 1993

Land Code of the Republic of Tajikistan, 1996

Water Code of the Republic of Tajikistan, 2000

Forest Code of the Republic of Tajikistan, 2011

Law of the Republic of Tajikistan “On Land Reform”, 1992

Law of the Republic of Tajikistan “On Nature Protection”, 1993

Law of the Republic of Tajikistan “On Subsoils”, 1994

Law of the Republic of Tajikistan “On Land Assessment”, 2001

Law of the Republic of Tajikistan “On Hydrometeorological Activity”, 2002

Law of the Republic of Tajikistan “On Ecological Expertise”, 2003

Law of the Republic of Tajikistan “On Production and Safe Handling of Pesticides”, 2003

Law of the Republic of Tajikistan “On Ensuring Sanitary and Epidemiologic Safety of Population”, 2003

Law of the Republic of Tajikistan “On Protection and Use of Flora”, 2004

Law of the Republic of Tajikistan “On Protection of the Population and Territories from Emergency Situations of Natural and Manmade Origin”, 2004

Law of the Republic of Tajikistan “On Licensing of Certain Types of Activities”, 2004

Law of the Republic of Tajikistan “On Biological Safety”, 2005

Law of the Republic of Tajikistan “On Inspection of Economic Entities in the Republic of Tajikistan”, 2006

Law of the Republic of Tajikistan “On Wildlife”, 2008

Law of the Republic of Tajikistan “On Land Administration”, 2008

Law of the Republic of Tajikistan “On Soils Conservation”, 2009

Law of the Republic of Tajikistan “On Environmental Education”, 2010

Law of the Republic of Tajikistan “On Potable Water and Drinking Water Supply”, 2010

Law of the Republic of Tajikistan “On Environmental Protection”, 2011

Law of the Republic of Tajikistan “On Environmental Audit”, 2011

Law of the Republic of Tajikistan “On Environmental Information”, 2011

Law of the Republic of Tajikistan “On Environmental Monitoring”, 2011

Law of the Republic of Tajikistan “On Specially Protected Natural Areas”, 2011

Law of the Republic of Tajikistan “On Licensing”, 2011

Law of the Republic of Tajikistan “On Ecological Expertise”, 2012

Law of the Republic of Tajikistan “On Atmospheric Air Protection”, 2012

Law of the Republic of Tajikistan “On Use of Renewable Energy”, 2012

Law of the Republic of Tajikistan “On Beekeeping”, 2012

Law of the Republic of Tajikistan “On Food Safety”, 2012

Law of the Republic of Tajikistan “On Biological Management and Production”, 2013

Law of the Republic of Tajikistan “On Pastures”, 2013

Law of the Republic of Tajikistan “On Fish Farming, Fishing and Protection of Fishery Resources”, 2013

Law of the Republic of Tajikistan “On Energy Conservation and Efficiency”, 2013

Law of the Republic of Tajikistan “On Radioactive Waste Management”, 2013

State Environmental Program of the Republic of Tajikistan for 1998-2008 (1997)

National Action Plan of the Republic of Tajikistan for Environmental Hygiene (1999)

Regional Environmental Action Plan for Central Asia (2001)

National Programme of Action to Combat Desertification (2001)

Concept of Rational Use and Protection of Water Resources in the Republic of Tajikistan (2001);

Poverty Reduction Strategy Paper (2002)

National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity (2003)

Framework Document on Biosafety (2004)

National Program to Phase-out the Use of Ozone-Depleting Substances and Action Plan for its Implementation (2004)

Concept of Land Use in the Republic of Tajikistan (2004)

State Program on Development of Specially Protected Natural Areas of the Republic of Tajikistan for the period 2005-2015 (2005)

Forestry Development Program of the Republic of Tajikistan for 2006—15 (2005)

National Strategy for the Development of the Republic of Tajikistan for the Period until 2015 (2006)

National Environmental Action Plan (2006)

Program to Improve the Security of the Republic of Tajikistan With Clean Drinking Water for 2007-2020 (2006)

Concept of Transition of the Republic of Tajikistan to Sustainable Development for 2007-2030 years (2007)

Targeted Comprehensive Program for the Use of Renewable Energy Sources in Tajikistan for 2007-2015 (2007)

National Action Plan on Persistent Organic Pollutants (2007)

Concept of Environmental Protection in the Republic of Tajikistan (2008)

State Environmental Program of the Republic of Tajikistan for 2009-2019 (2009)

National Development Strategy of the Republic of Tajikistan for the period to 2015 (2010)

State Comprehensive Program for Environmental Education of the Republic of Tajikistan for the Period till 2020 (2015)

Web resources

Parliament of Tajikistan. <http://parlament.tj/>

Presidential Administration, Republic of Tajikistan. www.prezident.tj/

Committee for Environment Protection (CEP) under the Government of Tajikistan. <http://www.hifzitaibat.tj/>

Ministry of Agriculture, Republic of Tajikistan. <http://moa.tj/>

Ministry of Economic Development and Trade, Republic of Tajikistan. <http://medt.tj/>

Ministry of Finance, Republic of Tajikistan. www.minfin.tj/

Ministry of Energy and Water Resources, Republic of Tajikistan. www.minenergoprom.tj/

Ministry of Health, Republic of Tajikistan. www.health.tj/

Agency on Statistics under the Government of Tajikistan. <http://stat.tj/>

Agency on Standardization, Metrology and Certification. <http://standard.tj/>

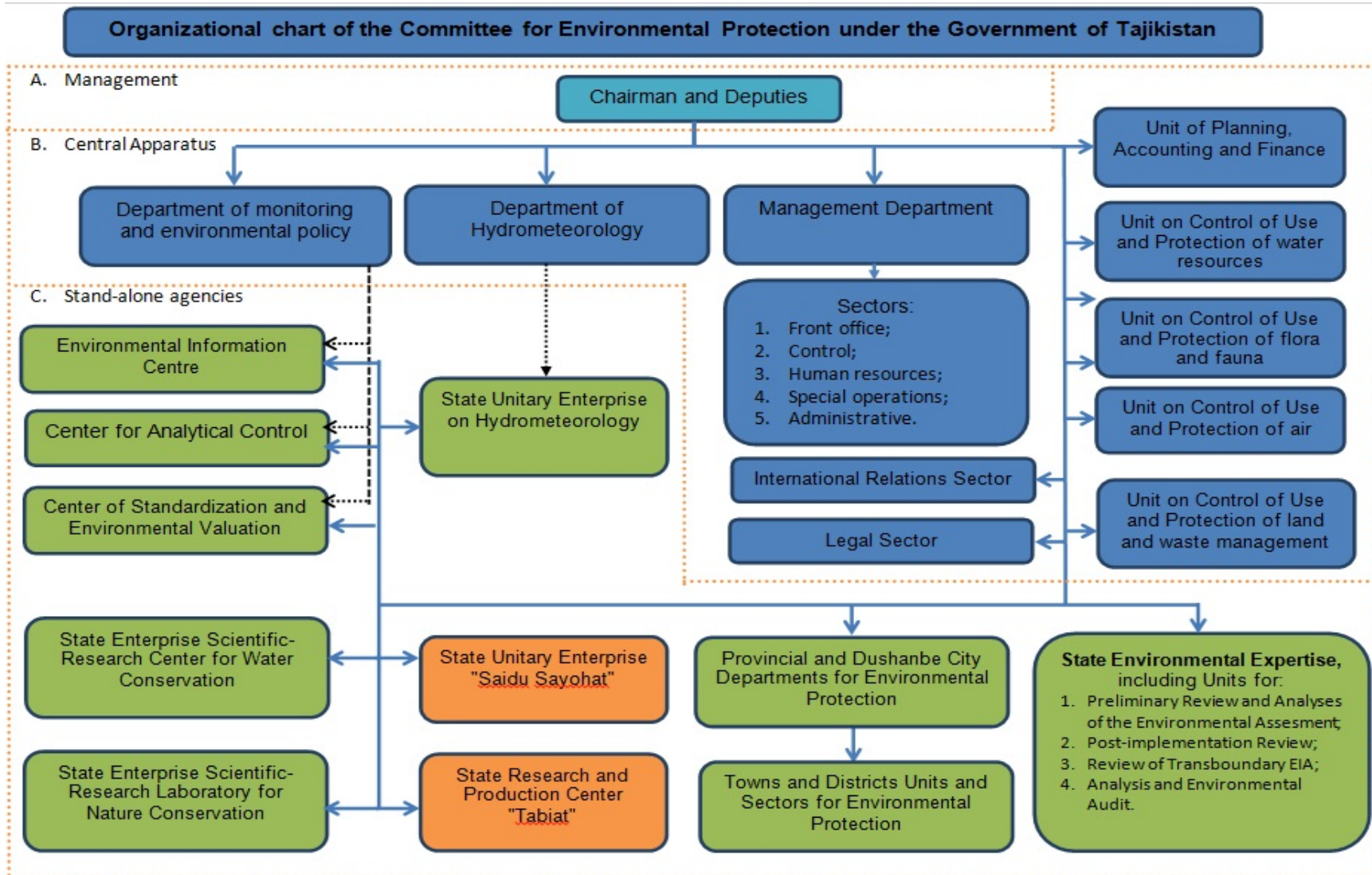
Tajik Forestry Agency, Republic of Tajikistan. <http://forestagency.tj/>

Tajik Meteorological Service under CEP. www.meteo.tj/

Tajik Academy of Science. www.anrt.tj/

Tajik Academy of Agricultural Science. <http://taas.tj/>

Annex A.2. Committee for Environmental Protection - Organization Chart



Technical Document B:
Global Environmental Benefits Assessment

TABLE OF CONTENTS

Abbreviations	32
1. Background	33
2. Biodiversity	33
3. Climate Change	37
4. International Waters	51
5. Land Degradation	54
6. Chemicals and Waste	60
Appendix B.1. References	64

Abbreviations

ADB	Asian Development Bank
CACILM	Central Asian Countries Initiative for Land Management
EMMP	Environmental Mitigation and Monitoring Plan
ES	Environmental Specialist
ESM	Environmental Supervisor and Monitor Expert
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GHG	greenhouse gas
GoT	Government of Tajikistan
HSE	Health, Safety, and Environment Management
NGO	nongovernmental organization
ODS	ozone-depleting substances
POP	persistent organic pollutants
PPCR	Pilot Program for Climate Resilience
UNEP	United Nations Environmental Programme
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

1. Background

The main purpose of the Global Environmental Benefits Assessment technical document is to review Tajikistan's contribution to the GEF mandate and its focal areas based on appropriate indicators such as those used during GEF-4 (2006—10) within the Resource Allocation Framework (RAF) concerning biodiversity and climate change, and those used during GEF-5 (2010—14) within the System for Transparent Allocation of Resources (STAR) concerning biodiversity, climate change, and land degradation. Other environmental indicators come from external sources referred to in GEF project documents. This document presents, based on existing information, the environmental benefits that Tajikistan could generate globally in response to the GEF mandate. The review is presented by GEF focal area. It has involved a literature review from relevant sources of information, including GEF-related and other available documentation and indicators.

2. Biodiversity

Two biodiversity global environmental benefits were considered for Tajikistan. First, conservation of globally significant biodiversity, including endemism, endangered/relict species/taxonomically unique species; globally threatened species in the Tajikistan Red Data Book and International Union for Conservation of Nature Red lists; and important ecosystems (nature conservancy hotspots, World Wildlife threatened regions), unique/rare ecosystems, important life support systems, boosting global biodiversity, global climate and water balance, areas supporting threatened/significant migratory species. Second, sustainable use of components of globally significant biodiversity, such as medicinal herbs, non timber forest products (NTFP) (from significant species) and wild relatives of food crops and yams that are important to food security especially due to climate change.

Natural ecosystems are the single reliable 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.

Tajikistan is located in one of the links of the Eurasian highland belt, stretching from the Atlantic to the Pacific Ocean. The formation of the peculiar local soil and climatic conditions is based on the physical and geographical characteristics of the territory. The soil composition is variable, with a clear division into belts (according to types): plains and low mountains (300—1,600 meters above sea level) with gray desert soils; medium-high mountains (1,600—2,800 meters above sea level) with brown mountain soils; high mountains (2,800—4,500 meters above sea level) with high-mountain and meadow steppe, steppe, zang, and desert soils; and nival belt (4500 meters above sea level) with skeletal soils.

Changeable mountain climatic conditions and hard natural historical processes promoted the formation of a unique biological diversity in Tajikistan. Annual average sunshine levels vary from 2,090 hours to 3,160 hours, and the average air temperature varies from +17 degrees centigrade and higher in the south of the country to -7 degrees centigrade and lower in the Pamirs. The highest temperature is in July, while the lowest is in January. The most severe climate is observed in the Eastern Pamirs, where the annual average temperature ranges from -1 degrees centigrade to -6 degrees centigrade. The absolute minimum (-63 degrees centigrade) is at the Bulunkul Lake. In hot deserts of Southern Tajikistan and in cold high-mountain deserts of the Eastern Pamirs, the annual average precipitation level varies from 70 millimeters to 160 millimeters, the maximum being in Central Tajikistan, sometimes exceeding 2000 millimeters a year. The mountain landscapes of Tajikistan contain 0.7 percent of the global fauna diversity and 1.8 percent of the global flora diversity.

The contrast combination of arid, subarid, and humid conditions, with the precipitation fluctuation from 70 millimeters to 2000 millimeters a year, promoted the formation of a complex and particularly rich flora (more than 9,000 species) and vegetation, from broadleaf forests and boreal meadows to subtropical and tropical deserts.

Forests only occupy 3 percent (412,000 hectares) of the land area of the country, but still play an important role in the conservation of biodiversity and genetic resources as well as in atmospheric carbon absorption. In addition, forests are a natural protection for human settlements against floods, avalanches, and soil erosion. They also regulate the water balance and microclimate.

Almost all forests in Tajikistan belong to the state and are considered to be Group 1 forests. Forest management activities are directed at conservation and the improvement of forest conditions, in particular the open juniper forest at 1,500 meters to 3,200 meters above sea level. Pistachio trees, well accustomed to the hot dry climate, are mostly found in Southern Tajikistan at an elevation of 600 meters to 1,400 meters. Walnut forests are characteristic of Central Tajikistan at 1,000 meters to 1,200 meters 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.

Since the 1930s, there has been intensive reclamation of foothill and floodplain valleys to increase the area of arable land in Tajikistan but up to 100 thousand hectares of floodplain, pistachio, and partially broad-leaved forests were destroyed in the process. During the economic and energy crises in 1990s, juniper forests, which are difficult to reforest, were cut down. Deforestation and animal grazing in forest areas have had a negative impact on the quality and diversity of forests and the natural regeneration of forests has practically stopped.

Pasture makes up 80 percent of agricultural land and is mainly found in the Khatlon region. Pasture stocking is lower than during the Soviet period 25 years ago and the condition of pastures is inadequate. In East Pamir the condition of the teresken (*Eurotea*) pastures has become critical. Here, due to a lack of energy sources, people have started massively uprooting teresken, a valuable animal fodder, and this has resulted in the desertification of highland pastures. In other districts, cattle often graze near human settlements meaning local pastures have become overgrazed and degraded. More than half of the natural pastures in the country are in the highlands at altitudes varying from 1,700—2,000 to 3,500 meters above sea level.

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 national biodiversity genetic pool.

Table B.1 Main Components of Biodiversity in Tajikistan

Component	Importance
Ecosystems	12 types
Types of vegetation	20 types
Flora	9 771 species
Wild relatives of cultivated plants	1 000 species
Endemic plants	1 132 species
Plants, listed in the Red Data Book of Tajikistan	226 species
Agricultural crops	500 varieties
Fauna	13 531 species
Endemic animals	800 species
Animals, listed in the Red Data Book of Tajikistan	162 species
Domestic animals	30 breeds

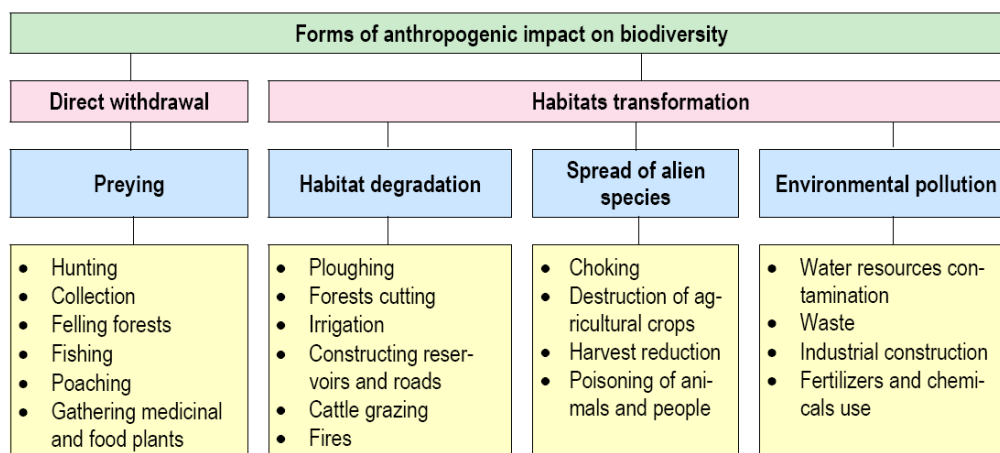
Source: Republic of Tajikistan 2003a.

Box B.1. Value of Biological Resources for the Population of Tajikistan

The local population traditionally uses wild nature products as raw materials in construction, utensils, and dyers production, and so on, and so forth.

Over a million heads of cattle, two million sheep and goats, and 700,000 horses are being raised due to the natural vegetation of pastures. Local people gather wild berries such as sea buckthorn (*Hippophae rhamnoides*), barberries (*Berberis*), currants (*Ribes*), raspberries (*Rubus odoratus*), hawthorn (*Crataegus*), and so on, and so forth, as well as mushrooms and dozens of medicinal plant species. They gather nuts such as walnuts (*Juglans*), pistachios (*Pistacia*), almonds (*Amygdalus*), and stone fruits such as wild apple (*Malus*), pear (*Pyrus*), plum (*Prunus*), cherry plum (*Prunus sogdiana*) and so on, and so forth, in naturally growing forests. Local people and specialized organizations store medicinal plants. A small part of the population is engaged in hunting and fishing. There are 11 species of game, 36 species of birds, and 20 species of fish. Furskins of red marmot (*Marmota caudata*), muskrat (*Ondatra zibethica*), fox (*Vulpes vulpes*), badger (*Meles meles*), wolf (*Canis lupus*), and so on, and so forth, are stored and international hunting is organized for argali (*Ovis ammon*), Siberian ibex (*Capra sibirica*), urial (*Ovis vignei*), and Tajik markhur (*Capra falconeri*). Game fishing in lakes and water reservoirs is minor (164 tonnes). Most of fish and animals are caught by poachers.

Figure A.1 Main Factors of Anthropogenic Impact on Biodiversity



Source: Republic of Tajikistan 2003b

In the last 50 years, the anthropogenic impact means 226 plants and 162 animal species listed in the Red Data Book of Tajikistan (Republic of Tajikistan 1988) have become rare or endangered, while 10 vertebrate species are listed in the Red List of the International Union for Conservation of Nature.

Reptiles and mammals have become the most vulnerable, indeed 50 percent of mammals and 445 percent of reptiles are listed in the Red Data Book of Tajikistan. Among the vertebrates of Tajikistan, the psammobiont forms of reptiles (*Crossobamon eversmanni*, *Teratoscincus scincus*, *Phrynocephalus myctaceus*, *Echis carinatus*, and so on, and so forth) turned out to be the most vulnerable to the anthropogenic transformation.

Destruction of native habitats and the deterioration of the environment in 1954 caused the extinction of the Turan tiger (*Panthera tigris virgata*). In total, three species of animals and 16 species of plants are extinct.

Table B.2. List of Extinct Species

Flora	Fauna
<i>Silene caudata</i>	<i>Panthera tigris virgata</i>
<i>Juno popovii</i>	<i>Marmota menzbieri</i>
<i>Juno tadshikorum</i>	<i>Pseudoscaphirinchus fedtschenkoi</i>
<i>Astragalus darvasicus</i>	
<i>Hedysarum korshinskyanum</i>	
<i>Oxytropis mumynabadensis</i>	
<i>Allium gracillimum</i>	
<i>Allium incrustatum</i>	
<i>Allium minutum</i>	
<i>Allium paulii</i>	
<i>Allium schugnanicum</i>	
<i>Bellevalia inconspicua</i>	
<i>Eremurus micranthus</i>	
<i>Tulipa anisophylla</i>	
<i>Delphinium nevskii</i>	
<i>Populus cataracti</i>	

Source: Republic of Tajikistan 1988.

The Government of Tajikistan has been taking steps to reverse the loss in biodiversity. Impressive steps have been taken in ex-situ conservation through GEF interventions including the In Situ/On Farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia project (GEF ID 1025). Efforts have also been taken to improve in-situ conservation.

The proportion of land under some form of nature conservation protection has increased from 4 percent to about 22 percent since independence. The approach to in-situ conservation has also been modified, with more involvement of local communities, possibly driven by nongovernmental organizations.

Since 2014, protected areas of Tajikistan occupy a total area of 3.1 million hectares or 22 percent of the country. These include: four nature reserves with a total area of 173,418 hectares; thirteen Zakazniks (reserves) of 313,260 hectares; one national park of 2.6 million hectares; one historical and natural park of 3,000 hectares; and one natural park of 3,805 hectares.

The Pamir National Park (also known as the Tajik National Park) was established in 1992. It is a national park and nature reserve in eastern Tajikistan and is the largest protected area in Tajikistan and Central Asia. In 2008, a request was made for it to be made a UNESCO (United Nations Organization for Education, Science and Culture) World Heritage Site which was accepted in 2013. The national park features a mix of steppe, desert, grassland, and alpine regions. It has long cold winters and cool summers and an average annual rainfall of 12.7 centimeters. Species known to live in the national park include the brown bear, snow leopard, wolf, markhor, Marco Polo sheep, brown-headed gull, and bar-headed geese.

Table B.3. GEF Projects and Alignment to Biodiversity Global Environmental Benefits

ID	Name	Conservation of globally significant biodiversity	Sustainable use	Sharing of GEBs from genetic resources	Other GEBs
996	Biodiversity Strategic Action Plan with Clearing House Mechanism	☑☑ ^a	☑☑	☑ ^b	CC/IW
1854	Biodiversity Conservation and Sustainable Development in the Gissar Mountains of Tajikistan	☑☑	☑☑	☑☑	LD/CC
1872	Community Agriculture and Watershed Management	☑	☑	☑	LD/CC/IW
1928	National Capacity Needs Self-Assessment for Global Environmental Management (NCSA)	☑	☑	☑	LD/CC/PO Ps/IW
2037	Dashtidzhum Biodiversity Conservation	☑☑	☑☑	☑☑	LD/CC
2528	Additional Financing for Capacity Assessment in Biodiversity Priority Areas	☑☑	☑☑	☑	LD/CC
3129	Sustaining Agricultural Biodiversity in the Face of Climate Change	☑☑	☑☑	☑	LD/CC
3211	Support for the Implementation of the National Biosafety Framework of the Republic of Tajikistan	☑☑	☑☑	☑	LD/CC
3234	Central Asian Countries Initiative for Land Management (CACILM): Rural Development Project under CACILM Partnership Framework, Phase I	☑	☑		LD/CC
3310	Environmental Learning and Stakeholder Involvement as Tools for Global Environmental Benefits and Poverty Reduction	☑	☑	☑	LD/CC/PO Ps/IW
4352	Environmental Land Management and Rural Livelihoods	☑☑	☑☑	☑	LD/CC
4694	Support for the Revision of the National Biodiversity Strategy and Action Plan and Development of Fifth National Report to the United Nations Convention on Biodiversity	☑☑	☑☑	☑	LD/CC
5236	Strengthening Capacity for an Environmental Information Management and Monitoring System in Tajikistan	☑	☑	☑	LD/CC/PO Ps/IW
6949	Conservation and Sustainable Use of Pamir Alay and Tian Shan Ecosystems for Snow Leopard Protection and Sustainable Community Livelihoods	☑☑	☑☑	☑☑	LD/CC

Note: CC = climate change; IW = international waters; LD = land degradation; POPs = persistent organic pollutants.

a. ☑☑ - Indicates main objectives cover this global environmental benefit and was/will be primary focus.

b. ☑ - Indicates main objectives cover this global environmental benefit but with less focus.

3. Climate Change

Global environmental benefits in the climate change focal area is the sustainable reduction of the concentration of GHGs in the atmosphere. Specifically, it includes

- mitigated GHG emissions
- increased use of renewable energy and decreased use of fossil energy resources
- improved energy efficiency

- increased adoption of innovative technologies and management practices for GHG emission reduction and carbon sequestration
- conservation and enhanced carbon stocks in agriculture, forest, and other land use

To implement its commitments to the United Nations Framework Convention on Climate Change (UNFCCC) and strengthen climate protection measures, Tajikistan has to date produced three national communications on climate change. Tajikistan is one of the pioneers in the preparation of a National Action Plan for Climate Change Mitigation (2003) within its territory. The plan includes adaptation measures many of which are being implemented and recommendations on updating the National Action Plan are currently being developed.

Tajikistan is convinced that the countries' intentions and commitments with regards to GHG emissions must be implemented by all convention parties but with consideration to their specific emissions, socioeconomic conditions and development needs, geographic location, as well as the availability of financial resources and technologies.

According to the last inventory of GHG emissions (2004—10) and as confirmed by international sources, the level of absolute and per capita emissions in Tajikistan remains the lowest in Central Asia. Although Tajikistan does not have quantitative UNFCCC commitments on the reduction of emissions, the current level of emissions as compared to 1990 have reduced by one third, mainly due to the collapse of the Soviet Union and structural changes resulting from the transition to a market economy and independence. In the last decade, the level of carbon dioxide has remained quite stable, however an increase of emissions is expected.

The break down of emissions in Tajikistan differs from other Central Asian countries. Since the late 1990s, agriculture has been the main source of GHG emissions. Considering the low level of mechanization, underfeeding of livestock, and limited use of fertilizers, emissions from the agriculture sector of Tajikistan are lower than in the other countries of Asia and Europe. Opportunities for any considerable reduction of Tajikistan's agricultural carbon footprint are therefore limited, while measures in other economic subsectors are more promising, especially in energy and industry.

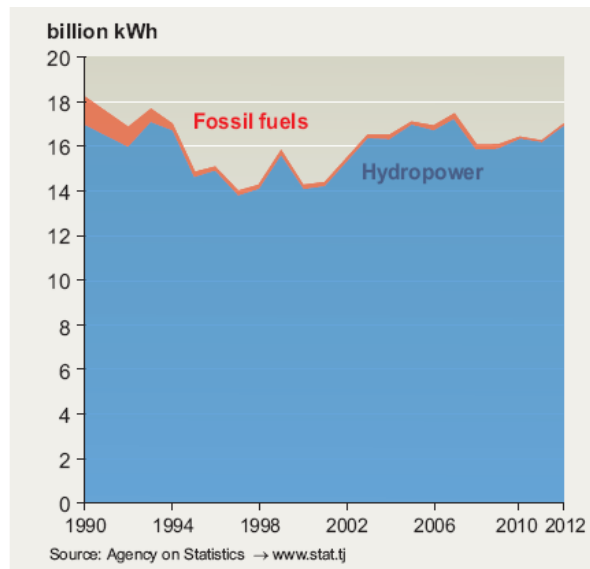
Currently, 98 percent of electricity in Tajikistan is hydropower generated.⁵ Hydropower produces a minimum level of carbon dioxide and has a great potential for development and growth. Therefore, energy consumption could increase and still result in a smaller demand for other sources of energy. Neighboring countries could also use electricity from Tajikistan to reduce their carbon footprint. Since 2010, coal mining has increased as a measure to address seasonal energy deficits and as a substitute for gas imports, which are often problematic. This coping strategy might result in an increase in carbon dioxide emissions in the near future. From an environmental point of view this option is not ideal, however the country's acute energy deficit, coupled with population growth, slowed the pace of development and consequently the capacity to eliminate poverty.

In 2010, GHG emissions from the energy sector totaled 1.2 million tons or less than 10 percent of emissions in 1990. During the same year, the International Energy Agency (IEA) estimated that energy emissions in Tajikistan reached 2.8 mln tons per year.⁶ The difference occurs because of the lack of balance between supply and demand, and also due to different calculation and registration methods.

⁵ On average. For example, in 2013, almost 100 percent of energy was hydropower generated.

⁶ www.iea.org/statistics/statisticssearch/report/?country=TAJKISTAN&product=indicators&year=2010

Figure B.2. Power Generation



Despite sufficient per capita production indicators, energy supply to the rural population is limited and the energy deficit during autumn and winter reaches 2.5 billion kilowatts hours. Therefore, power supply limits are introduced every year. Except for the larger cities, electricity is supplied to the population for two to eight hours per day. These circumstances compel the rural population to use forest wood, cotton stems, and other biomass for heating and preparing food. The rural population make up 75 percent of the total population, but use less than 10 percent of the total volume of electricity. Annually, due to electricity cuts in rural areas, agricultural losses reach 30 percent and many small entities stop working.

During the summer months, Tajikistan can generate sufficient electricity to meet local demand and also export to neighboring countries. The volume of water discharge through hydropower plant turbines depends on the dryness of the year and varies from 3.5 to 7.5 billion kilowatts hours, averaging 6 billion kilowatts hours. Taking into account high demand for electricity in several neighboring countries such as Afghanistan and Pakistan, Tajikistan could make significant profits from selling surplus energy to external consumers.

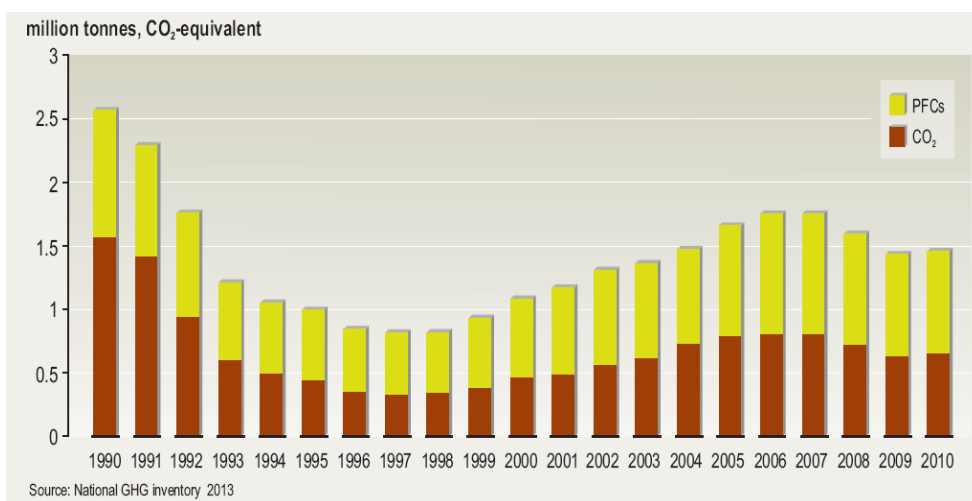
Tajikistan has the lowest number of automobile users among the Central Asian countries, as it has the lowest general level of transport emissions. The present sector fully relies on imported fuel. As the price of natural gas is lower than the price of petrol and diesel, the number of vehicles fueled using liquefied natural gas (LNG) or with hybrid fuel systems is higher than the number of vehicles using other types of fuel. Since the emissions of vehicles running on gas as compared to those running on petrol are lower, the overall level of emissions in the sector is not high.

New road infrastructure, such as tunnels and improved roads in mountainous areas, have considerably reduced travel times and consequently fuel consumption. This has in turn led to reduced emissions and increased road safety as well as improved transport communication between the regions and remote districts of the country.

In addition to burning fuel, GHG emissions are also created by non-energy industrial processes where materials transform from one state to another. Methodology developed by the Intergovernmental Panel on Climate Change prevents double counting of emissions in industry since the emissions resulting from fuel burning are covered under the energy sector. The input of GHG emissions from the industrial processes'

sector varies from 6 percent to 20 percent of total national emissions for different years. In 2010, emissions in this category were equivalent to 58 percent of emissions in 1990. The lowest emission rates were observed in 1996—98. For the period covered by the national inventory (2004—10), the highest levels of emissions occurred in 2007 (814 gigagrams) due to industrial growth. Consequently, following the global economic crisis in 2008 and reduction of natural gas imports, the volume of cement and ammonia production has reduced. Moreover, due to lack of natural gas supply in 2009—10, ammonia production was discontinued. As a result, compared to 2005, carbon dioxide emissions in 2010 fell by 20 percent.

Figure B.3. GHG Emissions from Industrial Processes



In Tajikistan, the natural absorption of carbon dioxide takes place as a result of:

- increase in forests and other wood biomasses
- conversion of forests and pasture lands
- land use dynamics

After the collapse of the Soviet Union, the supply of coal and gas was stopped and power supplies to the rural population were reduced. People were therefore compelled to use available wood biomass. The woodlands most frequently used were field shelterbelts and woodland belts along the highways and near to communities.

Forest cover comprises only 3 percent of the land area of Tajikistan and the recent intensive deforestation has reduced the carbon absorption capacity of forests. Reforestation is half of what it was compared to 1990. One of the key indicators of forest health is its stand density. With an average norm of 0.5 cubic meters to 0.6 cubic meters in 1990 the share of medium stocking was 50 percent, but by 2007—10 it had dropped to 30 percent. This is mainly the result of human activities such as forest cutting, as well as animal grazing, fires, and an increase of forest pests. According to expert observations, the standing tree crop has declined from 1.3 cubic meters per person in 1990 to 0.8 cubic meters per person in 2010. Ongoing reforestation efforts are insufficient for full reforestation and even under such circumstances, forests absorb a considerable proportion of all emissions. Fruit and nut trees planted to ensure food security are also taken into account in emission reporting. During the last few years, an increase in sequestration of carbon dioxide in wood biomass has taken place through tree planting.

The contribution of GHG emissions from the agriculture sector ranged from 20 percent to 62 percent of total national emissions depending on the year. From 2000, the agricultural sector was among the key sources of emission, and the 2010 emissions were equivalent to 110 percent of the 1990 levels. In the agriculture sector,

the main GHGs are methane and nitrous oxide with the largest share coming from livestock digestion (80 percent to 85 percent). The smallest proportion comes from methane from animal waste (manure) (approximately 10 percent). Methane emissions from rice paddles and the burning of agricultural waste do not exceed 8 percent. Annually the area for rice cultivation varies between 12 thousand hectares and 20 thousand hectares. The main rice cultivation regions are the Sughd and Khatlon oblasts. In 2010, rice cultivation reached 15 hectares. Rice is traditionally cultivated through regular check dam flooding of rice fields that creates methane emissions through the anaerobic decomposition of organic substances.

Twenty years ago domestic waste comprised a very small share of the total emissions. However, due to changes in the overall composition of emissions, there has been a notable increase in domestic waste levels. In theory, all domestic waste is arranged in waste landfills and only a small part is processed informally. There are landfills in all major cities, although not enough for the whole country.

For the national inventory, the waste sector covered solid domestic waste landfills, and complex non-industrial and industrial waste water treatment plants. The waste sector has the smallest volume of emissions making up 3 percent to 9 percent of total volume in carbon dioxide equivalent. GHG emissions in 2010 were 70 percent of their 1990 equivalent. Between 1991 and 1999, emissions were reduced. Methane emissions fell by 30 percent in 1999 compared to 1998 and this was primarily linked to fall in the number of disposal sites (70 to 52), controlled landfills (5 to 3), and uncontrolled deep landfills (12 to 7).

Over the last decade, especially between 2005 and 2010, emissions have been increasing. The number of controlled landfills rose from three to four (Dushanbe, Khujand, Vahdat, and Tursunzade) while there are now seven uncontrolled landfills with waste pipes thicker than five meters (B. Ghafurov, Istarafshan, Isfara, Khorog, Somoniyon, Sarband, and Kulyab). The number of shallow landfills with waste pipes thicker than five meters has reached 52. In total, there are 63 solid domestic waste landfills and 105 complex waste water treatment plants. Since Tajikistan has no adequate infrastructure for collecting and processing sorted waste except from individual initiatives on collecting waste paper, waste metal, and plastic, all waste is offset out in landfills. The major contribution is made by emissions from solid domestic waste (95 percent to 97 percent). An increase in emissions is mainly linked to the growth of the urban population, the volume of waste, and the number of disposal sites.

Table B.4. Key Sources of GHG in 2010

	Sector	IPCC source	Gas	CO ₂ equivalent (Gg)	%	Cumulative total
4.D	Agriculture	Agricultural areas (direct and indirect emissions)	N ₂ O	2681.80	29.44	29.44
4.A	Agriculture	Digestion by domestic animals	CH ₄	2436.77	26.75	56.18
2.C	Industrial processes	Aluminum production	PFCs	822.74	9.03	65.21
6.A	Waste	Solid domestic waste landfills	CH ₄	532.38	5.84	71.06
2.C	Industrial processes	Aluminum production	CO ₂	523.56	5.75	76.80
4.B	Agriculture	Animal waste and compost emissions	CH ₄	360.01	3.95	80.76
1.A.2	Energy	Industry and construction	CO ₂	328.06	3.60	84.36
1.A.4	Energy	Housing and Communal management	CO ₂	305.61	3.35	87.71
4.B	Agriculture	Animal waste and compost emissions	N ₂ O	198.77	2.18	89.89
1.A.3	Energy	Vehicles	CO ₂	176.46	1.94	91.83
1.A.3	Energy	Aviation	CO ₂	125.16	1.37	93.20
4.C	Agriculture	Rice cultivation	CH ₄	119.80	1.31	94.52
6.B	Waste	Waste water	N ₂ O	112.40	1.23	95.75
2.A	Industrial process	Production of cement	CO ₂	102.98	1.13	96.88

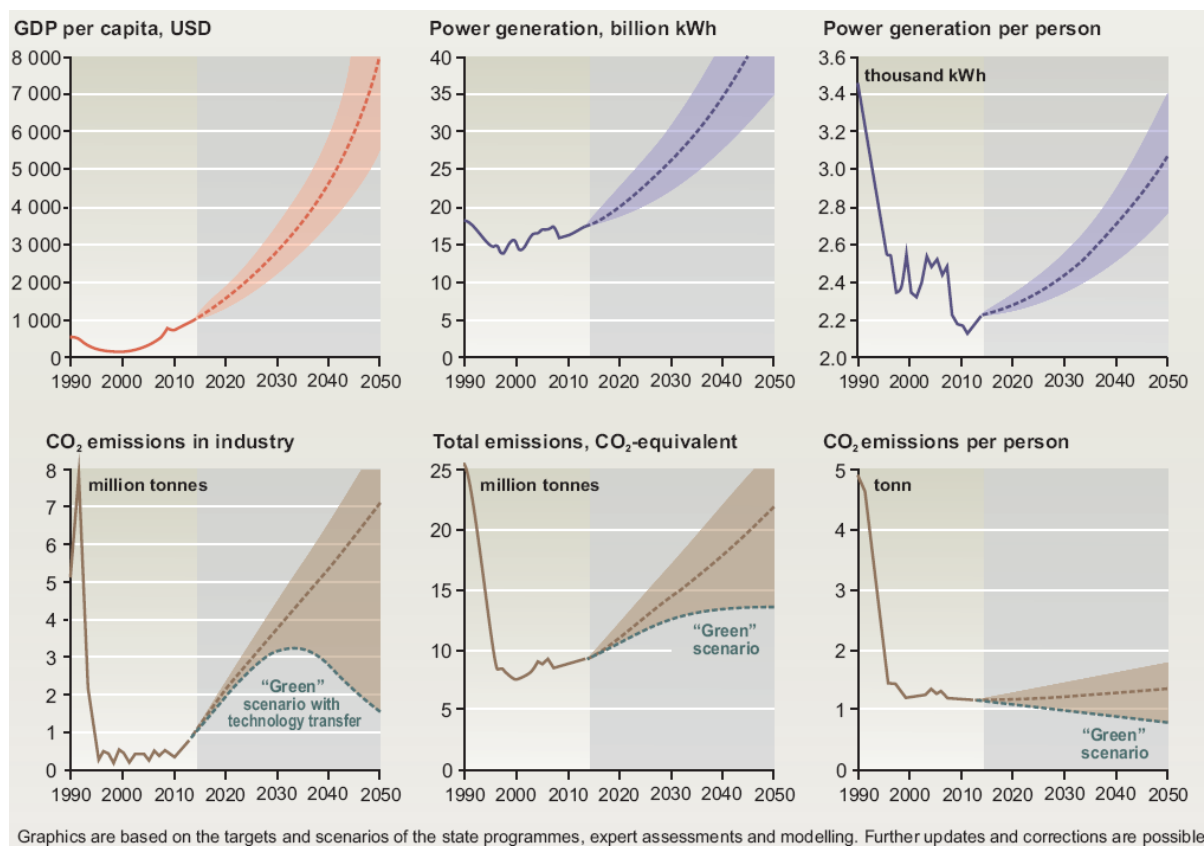
Source: Republic of Tajikistan State Administration for Hydrometeorology Committee on Environmental Protection under the Government of the Republic of Tajikistan 2014.

Note: N₂O = nitrous oxide, CH₄ = methane, PFCs = perfluorinated compounds, CO₂ = carbon dioxide.

Uncertainty assessment characterizes the level of dispersion and possible deviations of data in comparison with its true value. Information on uncertainty enables identification of the priority measures for a more accurate assessment of emissions in further inventories and information on uncertainty can be taken into account when planning for GHG emission reduction. The final uncertainty is a combination of uncertainties in coefficients of emissions and uncertainties in data on activities.

Uncertainties are subdivided into three levels: low level (high reliability) if uncertainty is less than 10 percent; medium level if uncertainty is between 10 percent and 50 percent; and high level if uncertainty is high (low reliability) and is equivalent to greater than 50 percent. The final uncertainty of the present inventory is assessed to be medium level. At the same time, in some sectors such as industrial process the level of uncertainty is low, while for other sectors (agriculture; land use, land use change, and forest management; waste) the uncertainty level is high. The level of uncertainty in the energy sector is medium because of the lack of a robust energy balance and taking into account the most reliable data on fuel consumption.

Figure B.4. Scenarios of Economic Development, Energy, and GHG Emissions until 2050



Source: Republic of Tajikistan State Administration for Hydrometeorology Committee on Environmental Protection under the Government of the Republic of Tajikistan 2014.

There is a high level of uncertainty with regards to the use of fuel for transport and sectoral GHG emissions. This is due to the quality and completeness of data on fuel consumption, and to the rapid technological progress taking place in the West in the use of electric vehicles. This might also be a good option for Tajikistan, given its rich hydropower resources. By 2020—30, it is expected that electric vehicles will be better positioned than traditional vehicles in terms of cost and usability.

In the land use, land Use change, and forest management sector, a growth in the volume of carbon dioxide absorption has been observed since 2000. In the last decade, as a result of changes in land use, improvement in land registration and control, introduction of effective management methods, and forest improvement, the volume of carbon dioxide absorption by soil and wood biomasses has been increasing. In 2010, carbon dioxide absorption reached 110 percent of its equivalent in 1990. By 2020, carbon dioxide absorption is expected to increase by 120 percent or 1.8—2 million tons of carbon dioxide in absolute figures.

Tajikistan continues to seek ways to reduce emissions by increasing energy efficiency and increasing the role of renewable energies. Energy efficiency is increasingly becoming a priority on the national policy agenda. It contributes to increasing energy supply security, maintaining a high level of GDP growth, and overcoming environmental concerns with the main driver being climate change. Legislation on energy efficiency has recently been formulated and implemented. The next step in the process is to encourage investments in energy efficiency using market mechanisms. Moreover, several projects supported by the Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD), the GEF, the World Bank

Group, the United Nations Development Programme (UNDP), and other financing facilities focus on energy efficiency and renewable energy.

The GEF has supported limited activities to isolate carbon, but the goal of sequestering terrestrial carbon is largely a secondary benefit of projects in the biodiversity or land degradation focal areas.⁷

According to NASA (the National Aeronautics and Space Administration of the United States), Central Asia is one of the regions to have experienced a pronounced warming of its climate since 1950 (State Administration for Hydrometeorology Committee on Environmental Protection under the Government of the Republic of Tajikistan 2014). Many countries in Central Asia, not just Tajikistan, are experiencing the impact of climate change in the form of increased temperatures, melting glaciers, and transformed river flows.

Between 1940 and 2012, the temperature of plain areas of Tajikistan rose at an average rate of 0.1 degrees centigrade to 0.2 degrees centigrade per decade. Since 1940, the highest increases in temperature were observed in Dangara and Dushanbe (0.5 degrees centigrade to 0.8 degrees centigrade). Other areas, such as Khujand, experienced a rise of 0.3 degrees centigrade per decade with the lower increase being due to the impact of irrigation and water reservoirs. In mountainous districts, the average temperature increase was 0.3 degrees centigrade to 0.5 degrees centigrade, with the exception of some districts where trends are less prominent. In highland areas (above 2,500 meters), the temperature increased by 0.2 degrees centigrade to 0.4 degrees centigrade.

The warmest decade in the history of instrumental observations in Tajikistan was from 2001—10. In zones up to 1,000 meters, the average temperature was 1 degree centigrade above average. At altitudes of 1,000 meters to 2,500 meters the average temperature was exceeded by 0.8 degrees centigrade and in highland zones by 0.2 degrees centigrade. The hottest year was 2001, with annual temperatures exceeding the average by 1.0 degrees centigrade to 1.6 degrees centigrade. Similar situations were observed in the plain and mountainous districts in 2004 and 2010.

Between 1940 and 2012, annual precipitation increased by 5 percent to 10 percent. However, the diversity of geographic and climatic zones in Tajikistan creates a varied and complex pattern of change. The driest decade was 1940—50 that was followed by both dry and humid periods. In some instances, an increase in average precipitation was largely caused by increased precipitation intensity and a reduction in the number of days with precipitation per year. The annual amount of rainfall during the period 2000—10 was also above the annual average, with the exception of certain years that resulted in a river discharge.

The glaciers and snow reserves of Tajikistan are the main sources of river flow formation and are located in the highlands at and above 2,500 meters above sea level. Glaciers and snow cover are very sensitive to climate variations. Even small changes in summer temperature (by 0.5 degrees centigrade to 1 degree centigrade) can cause visible changes in the firn line (by height) and reduce glaciers by 30 percent or more.

From the mid-20th century until the beginning of the 21st century (that is 2003—10), the area of glaciers in the Vakhsh river basin, including upstream of the river in Kyrgyzstan, has fallen from 3,700 square kilometers to 3,200 square kilometers (between 8 percent to 10 percent according to different sources). The area of glaciers in the Pyanj river basin, including feeder glaciers in Afghanistan, has fallen from 3,900 square kilometers to 3,600 square kilometers (between 9 percent to 15 percent) according to different sources. The current area of glaciers of Gissar-Allai within Tajikistan is approximately 500 square kilometers to 550 square kilometers, a

⁷ GHG emissions from land use are less certain than GHG emissions from fossil fuel combustion. The World Resources Institute estimates that land use changes accounts for approximately 30 percent of total worldwide GHG emissions. <http://cait.wri.org>.

reduction of between 20 percent to 25 percent during the period covered. This is similar to the trends observed in south-western Pamir.

If the dynamics described above continue and considering the impact of climate change, it is predicted that the area of glaciers could reduce by 40 percent to 50 percent in the Vakhsh river basin, and by 60 percent to 70 percent in the Pyanj river basin. Altogether, the size of glaciers are expected to decrease by 3,500 square kilometers to 4,000 square kilometers. Estimating the loss in the volume of glaciers is a challenging task given the insufficient and unreliability of the data. In the mid-20th century, the volume of glaciers in Vakhsh and Pyanj rivers was estimated at more than 400 cubic meters. By the middle of this century, assuming that the temperature will increase by 2 degrees centigrade and that there will not be any changes in the type and amount of precipitation, the volume of ice in upstream of Amudarya River could fall by half.

Melting of seasonal snow cover also plays an important role in the formation and nature of river discharge in Tajikistan. If the total amount of solid precipitation (and maximum snow reserves) in the mountains is retained, then no significant reduction of water resources due to loss of glaciers should be expected. However, an increase in air temperature during winter and spring reduces the snowfalls and the potential snow reserves; therefore it results in an earlier melting of snow cover.

The impact of climate change on the nature is diverse. For instance, scientists link climate change with the reduction of habitat of the very rare marmot Menzbira (*Marmota menzbieri*), included in the Red Book of Tajikistan, in the Kuramin range in northern Tajikistan and its population growth. According to local people and observations from a series of expeditions, vegetation cover and type has changed in the periglacial zones and in areas where glaciers are shrinking. This is quite likely related to climate change.

The production of grain, vegetables, and fruits represent the key source of income and livelihoods for many mountain communities of Tajikistan. The modeling of climate change and its impact on agriculture in local mountain communities is a challenging task. Cotton production, a key export crop, largely depends on agrotechnical measures and accessibility to irrigation water. Compared to other agricultural crops, cotton plants are able to cope with higher temperatures and high soil salinity meaning cotton production will be profitable under hot conditions.

Due to the increased intensity of rains, loss of soil, and erosion processes the sediment load of rivers will increase resulting in further sedimentation of irrigation channels, reservoir pumping stations, and reservoirs. Irrigation systems are currently inefficient and may be further aggravated by the water problem.

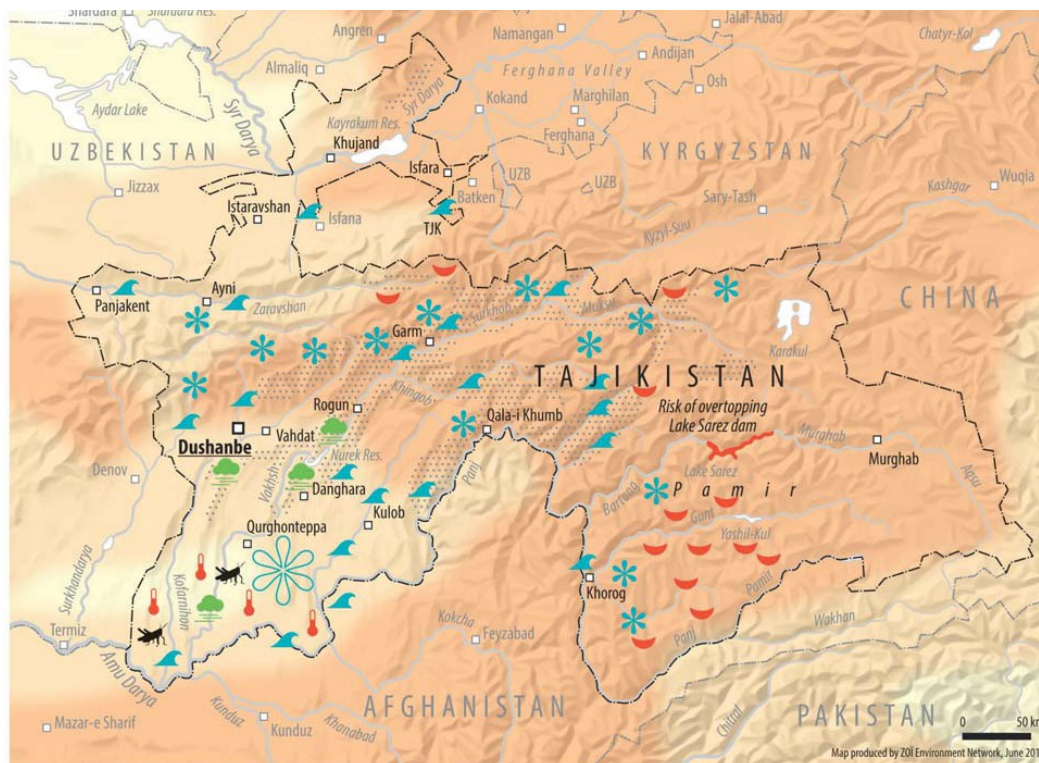
Weather conditions also affect the number of insect pests and insects transmitting infectious diseases. In the southern districts of Tajikistan, an outbreak of cotton budworm halved the cotton harvest. The size of the locust affected areas has also increased. In 2007, locusts destroyed 35 thousand hectares of crops and caused considerable damage.

Tajikistan has started developing targeted adaptation measures needed to deal with the effects of climate change. However, there is still much to be done, in particular when it comes to assessing the costs of these adaptation measures. The main impacts of climate change and vulnerabilities identified by Tajikistan are:

- increased risk of drought
- decreased water availability (concurrent with increased demand for water)
- increase in the frequency and intensity of floods associated with extreme rainfall events
- increased risk of desertification, particularly in arid and semi-arid areas
- loss of biodiversity in several ecosystems

The participatory vulnerability assessment carried out by UNDP in 2012 in different parts of the country revealed that the main climate change related concerns and adaptation priorities of the population included improving access to clean drinking water, increasing the effectiveness and reliability of irrigation systems, improving access to high quality seeds, and sustainable land management practices. Reliable access to energy in rural areas is also among the top priorities. NGO studies have resulted in similar findings.

Figure B.5. Climate Change Impacts and Vulnerability



Extreme weather and natural disasters

- | | | |
|---------------------|---|--|
| Seismic risk | Risk of landslides | Harsh winters causing compound crisis |
| very high | Risk of flooding and mudflows | Glacial lakes and lake outburst flood risk areas |
| high | Risk of major avalanches | Locust invasions |
| moderate | Increase in heat waves and number of days with high temperature | Decrease in the number of days with dust storms and hailstorms |

Source: www.zoinet.org

Despite efforts relating to climate change, global GHG emissions are continuing to increase and limiting the temperature increase within 2 degrees centigrade is becoming a rather challenging task. A further increase in global temperatures may have negative consequences for the environment, economy, and health of the population.

Precipitation and temperature scenarios were studied using the Community Climate System Model Version 3 (CCSM3), the fifth-generation atmospheric general circulation model (ECHAM5), the and CSIRO model based

on the three emission scenarios A1B, A2, and B1.⁸ According to the *Third National Communication of the Republic of Tajikistan under the United Nations Framework Convention on Climate Change*

The models do not show significant change in precipitation in Vakhsh and Pyanj river basins, however an increased variation in maximum and minimum precipitation has been observed. Thus, it is expected that the nature of precipitation will change with the amount of rainfall increasing and snowfall decreasing. There will be more intensive precipitation events of the type that usually occur only once in fifty years, especially in Pamir. Geographically, the annual amount of precipitation is likely to decrease in southern Tajikistan and neighboring areas, including Afghanistan; it is likely also to increase in the mountainous parts of the country. The amount of precipitation in Tajikistan is likely to increase during summer and winter and may reduce in spring and autumn (State Administration for Hydrometeorology Committee on Environmental Protection under the Government of the Republic of Tajikistan 2014).

Based on the in-depth discussions between national experts at the UNITAR workshop for policy-makers in Tajikistan for the UNFCCC process (Dushanbe, February 2014), a consensus was reached whereby it was predicted that the peak water discharge of the main non-regulated rivers of Tajikistan will shift to earlier months of the year. This will affect the economic sectors that depend on the water supply in Tajikistan, as well as in downstream countries. By the mid-21st century, water discharge in rivers will possibly be reduced in summer and early autumn, when demand for water from agriculture is significantly high. Interannual rainfall is expected to vary with some years seeing an abundance of water, while others are dry.

Preventive measures to protect catchment areas from erosion and run-off are required. Reservoirs also need to be desilted and new ones with the sufficient capacity to cope with sedimentation and dry periods need to be constructed. The Kairakkum hydropower plant, for example, was constructed to generate power and provide irrigation for downstream districts. Adaptation measures should therefore be viewed in a broader context. The change in river flow will possibly require all basin countries to revisit the operation regime of the reservoirs taking into account parameters such as hydroenergy, agriculture, and water ecosystems.

According to the conclusions of Tajikistan's first and second national communications on climate change, the predicted increase in air temperature and precipitation will contribute to an increased range and risk of communicable diseases including malaria, intestinal infections, and parasitic infections. Climate warming, longer periods of hot weather, floods, and droughts may negatively affect the quality of drinking water and contribute to outbreaks of infections and other diseases, including dysentery, typhoid, hepatitis A, salmonellosis, cholera, and lambliasis.

Warm weather increases the risk of microbial contamination of water in open reservoirs. The wastewater treatment facilities serving urban settlements of Tajikistan are ineffective due to a shortage of equipment and poor processes of waste water purification and this is one of the main causes of the vulnerability of people to water borne diseases. The proportion of the population of Tajikistan with access to safe drinking water fell from 63 percent in 1991 to 55 percent in 2012. In rural areas the coverage is only 35 percent. Another reason is that toilets, animal sheds, hen houses, and other buildings and facilities with contaminated water runoffs are often built near open reservoirs and water protective zones, as well as other violations of sanitary standards. More than 90 percent of the urban and rural populations have toilets. However, only 30 percent of the urban population and less than 1 percent of the rural population have toilets connected to the sewage systems.

Climate warming and the impact of floods means the risk of the spread of water borne infectious diseases will increase and heat waves due to climate warming will have an impact on the death rates of vulnerable

⁸ Section 4.8, Climatic Scenarios for XXI Century, 92.

population groups (children, elderly). The rise in temperature and the subsequent drought was one of the main factors that lead to increased mortality rates in 2000—01.

The Pilot Program for Climate Resilience (PPCR), approved in November 2008, was the first program developed and operated by the Strategic Climate Fund, a funding window of the Climate Investment Funds. The PPCR aims to pilot and demonstrate ways in which climate risk and resilience may be integrated into core development planning and implementation. In this way, it provides incentives for scaled-up action and initiates transformational change. The pilot programs and projects implemented under the PPCR are country-led, built on National Adaptation Programs of Action and other relevant country studies and strategies. They are strategically aligned with other donor funded activities to provide financing for projects that will produce experience and knowledge useful to designing scaled-up adaptation measures.

The Strategic Programme for Climate Resilience within the PPCR (Republic of Tajikistan 2011) provides an assessment of the likely impact of climate change on the agricultural sector in Tajikistan, and the options and opportunities for sustainable land management practices to adapt to climate change. It is expected that Tajikistan will continue to become warmer, especially in the winter, with prolonged dry periods and an increased risk of glacier outbursts.

The Government of Tajikistan is focused on economic growth, population welfare, poverty reduction, diversification of the economy, improving means of communication, and political stability. Altogether these measures provide the basis for developing climate change resilience. The main directions for enhancing the resilience to climate change include:

- Maintaining a stable and enhanced public administration by: introducing e-governance to enhance the performance of state institutions; reducing corruption and administrative barriers; improving information exchanges and access of users to key information, including information on climate change; modernizing and diversifying the economic sector; supporting the private sector; improving the investment climate and transport development; ensuring effective social protection for the population; supporting the stable development of the labor market and development of human capital; enhancing access to and the quality of education and health; ensuring all stakeholders' participate in the planning and implementation of climate change measures.
- Meeting fuel and energy demands by: developing hydroenergy potential and increasing the reliability coefficient taking into account the consequences of climate change (an increase of maximum floods and a reduction of flow); increasing the service lifespan of operational reservoirs and the construction/reconstruction of hydropower plants and dams, taking into consideration the impact of climate change on water resources and peak river water consumption; constructing new energy generation units; developing other renewable energy sources and modernizing existing equipment to meet the energy demand; constructing new power transmission lines within the country to increase access of the population to energy; constructing new power transmission lines to export hydroenergy outside the country; reducing the energy-intensiveness of the economy; enhancing energy efficiency and energy saving in the energy production, industry, construction, and agriculture sectors, as well as at the household level; stimulating and providing incentives for the use of gas fuels (liquid) in transport; raising awareness via mass media and the dissemination of brochures, leaflets, posters, and local-level workshops on renewable energy sources, the availability of renewable energy source devices, as well as their economic and environmental benefits.
- Addressing contradictions and shortcomings in the implementation of land reform and land management by: ensuring access to financial resources, credits, and agricultural extension services, including information and knowledge; developing infrastructure; developing policies focused on the

transition from a 'controlling' to 'stimulating' state; improving legal and regulatory frameworks, and taxations in agriculture that consider the importance and vulnerability of the agriculture sector to climate change; enhancing the responsibility of state bodies, including local governments, to ensure that land use rights are not violated and for exclude the government from intervening in production or business-related decisions of agricultural producers;

- Improving water and food security by: enhancing state control to ensure the safety of agricultural goods (based on Codex Alimentarius); developing organic land management and certification and incentive systems for producers; selecting and introducing drought-resistant grains, legumes, and other cultures; enhancing the effective use of water resources in agriculture; creating an insurance fund for the agricultural sector during emergency situations and in the context of climate change that improves existing storage facilities and construction of new ones for crop and livestock products; developing breeds and seed varieties in the context of climate change; improving pest and disease control in the context of climate change; raising awareness of and improving access by rural population, farmers, and other parties in the agriculture sector to information on climate change; improving livestock productivity through enhanced feed resources, pedigree stock breeding, expanded veterinary services, and establishment of modern abattoirs; improving soil productivity, crop rotation, bio-drainage, use of compost, low/no till, combined cropping, and community access to energy and water.
- Ensuring wide application of the principles of integrated water resource management by: gradually transitioning to the management of water resources based on hydrological basins rather than administrative units; creating basin committees and boards; developing countrywide water user associations; increasing irrigation channel efficiency through lining; applying differentiated water tariffs and incentives to save water and gradually increase energy tariffs to cover the full operational costs of irrigation systems; constructing reservoirs in narrow-mountain gorges to generate energy and store water, as well as control mudflows and flood risk; developing norms and the provision of minimum environmental flows; and conserving and expanding forest areas and density in river catchment areas.

Table B.5 GEF Projects and Alignment to Climate Change and Global Environmental Benefits

GEF ID	Project name	GHG mitigation	Increase in renewable energies and reduction in fossil fuels	Improved energy efficiency	Low carbon development	Carbon stocks	Other GEBs
830	Enabling the Republic of Tajikistan to Prepare its First National Communication in Response to its Commitments to the UNFCCC	<input checked="" type="checkbox"/> ^a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LD/BD/IW
1854	Biodiversity Conservation and Sustainable Development in the Gissar Mountains of Tajikistan	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LD/BD
1872	Community Agriculture and Watershed Management	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LD/BD
1886	Climate Change Enabling Activity (Additional Financing for Capacity Building in Priority Areas)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LD/BD/IW
1928	National Capacity Needs Self-Assessment for Global Environmental Management (NCSA)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LD/BD/IW
3027	Support to Sustainable Transport Management in Dushanbe	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> ^b	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LD/BD
3129	Sustaining Agricultural Biodiversity in the Face of Climate Change	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LD/BD
3234	CACILM: Rural Development Project under CACILM Partnership Framework, Phase I	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LD/BD
3237	CACILM: Demonstrating Local Responses to Combating Land Degradation and Improving Sustainable Land Management in SW Tajikistan-under CACILM Partnership Framework, Phase 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LD/BD
3310	Environmental Learning and Stakeholder Involvement as Tools for Global Environmental Benefits and Poverty Reduction	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LD/BD
4160	Technology Transfer and Market Development for Small-Hydropower in Tajikistan	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW
4352	Environmental Land Management and Rural Livelihoods	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LD/BD
4422	Increasing Climate Resilience through Drinking Water Rehabilitation in North Tajikistan	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		LD/BD/IW
5236	Strengthening Capacity for an Environmental Information Management and Monitoring System in Tajikistan		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
6949	Conservation and Sustainable Use of Pamir Alay and Tian Shan Ecosystems for Snow Leopard Protection and Sustainable Community Livelihoods		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		LD/BD

Note: GEB= global environmental benefits, LD = land degradation, BD = biodiversity, IW = international waters.

a. - Indicates main objectives of the global environmental benefits but with less focus.

b. - Indicates main objectives covering this GEB and was/will be the primary focal area

4. International Waters

Global environmental benefits targeted by GEF's work in international waters concern transboundary issues including:

- multi-state cooperation to reduce threats to international waters
- reducing pollution from nutrient enrichment and other land-based activities in international waters
- restoring and sustaining freshwater, coastal, and marine ecosystems goods and services, including globally significant biodiversity, and maintaining the capacity of natural systems to sequester carbon
- reducing vulnerability to climate variability and climate-related risks, and increasing the ecosystem's resilience

Glaciers and mountain ecosystems are abundant in Tajikistan and not only serve as water reservoirs and stream flow regulators, but also as the source of water for the Aral Sea river basins. The rivers of Tajikistan supply more than half of the flow to the Aral Sea basin.

The country has a few large river basins: the Sirdarya or Syr Darya (northern Tajikistan), the Zerafshan (central Tajikistan), the Kafirnigan, Vakhsh and Pyanj rivers (southwestern Tajikistan and Pamirs), and basin of closed lakes in the eastern part of Pamir. The total catchment area of these river basins (with tributaries) in Tajikistan is estimated at over 120,000 square kilometers, that is almost all territory of Tajikistan.

Tajikistan lies in the upstream areas along the Amu Darya River that is formed after the confluence of the Vakhsh and Pyanj rivers. Along the Syr Darya River, the country lies in the mid-stream areas. In these cases, the use of water resources in Tajikistan may affect the quality and quantity of water in downstream states.

Table B.6. Transboundary Waters in the Aral Sea Basin

Basin/subbasin(s)	Total area (km ²)	Recipient	Riparian countries
Amu Darya ⁹	612,000	Aral Sea	Afghanistan, Kyrgyzstan, Tajikistan, Uzbekistan, Turkmenistan
- Surkhan Darya	13,500	Amu Darya	Tajikistan, Uzbekistan
- Kafirnigan	11,590	Amu Darya	Tajikistan, Uzbekistan
- Vakhsh	39,100	Amu Darya	Kyrgyzstan, Tajikistan
- Pyanj	113,500	Amu Darya	Afghanistan, Tajikistan,
-- Pamir ¹⁰	10,000	Pyanj	Afghanistan, Tajikistan
-- Bartang	24,700	Pyanj	Afghanistan, Tajikistan
Syr Darya ¹¹	782,600	Aral Sea	Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan
- Naryn ¹²	59,900	Syr Darya	
- Kara Darya	28,630	Syr Darya	Kyrgyzstan, Uzbekistan
- Chirchik	14,240	Syr Darya	Kazakhstan, Kyrgyzstan, Uzbekistan
-Chatkal	7,110	Chirchik	Kyrgyzstan, Uzbekistan
Zeravshan ¹³	41,800	Desert sink	Tajikistan, Uzbekistan

⁹ While some literature sources quote a basin area of up to 612,000 square kilometers, the water divide can only be correctly established in the mountainous part of the basin (309,000 square kilometers). Therefore many hydrologists refrain from giving figures for the total basin area.

¹⁰ No exact figure. Some hydrologists give various figures from 5,000 square kilometers to 10,000 square kilometers.

¹¹ Some literature sources quote a basin area of up to 782,600 square kilometers. As with the Amu Darya, the water divide can only be correctly established in the mountainous part of the basin. Thus, many hydrologists do not give a figure for the total basin area but state that 142,200 square kilometers of the basin area is upstream of the point where the river leaves the Fergana Valley.

¹² The literature gives various figures for the size of the catchment area, from 58,370 square kilometers to 59,900 square kilometers.

¹³ Given the difficulty in measuring the area, many hydrologists simply give a figure of 17,700 square kilometers for the mountain part of the catchment area.

Source: UNECE 2007.

Note: km² = square kilometers.

Traditionally in Central Asia water is used mainly for agricultural purposes. However, it does not always reach the agricultural end-users due to the degraded irrigation infrastructure. Only 28 percent of the 47,750 kilometers of interfarm irrigation channels in the basin has anti-filtration linings, 77 percent of farm intakes have flow gauges, and just 21 percent of the 268,500 kilometers of on-farm channels have anti-filtration linings that retain on average 15 percent more water than unlined channels.

By 1960, between 20 cubic kilometers and 60 cubic kilometers of water were going each year to the land instead of the sea. Most of the sea water supply had been diverted, and in the 1960s, the Aral Sea began to shrink. From 1961 to 1970, the Aral Sea's level fell at an average of 20 centimeters a year. In the 1970s, the average rate nearly tripled to 50 centimeters to 60 centimeters per year, and by the 1980s, it continued to drop to a mean of 80 centimeters to 90 centimeters each year. The rate of water use for irrigation continued to increase. The amount of water taken from the rivers doubled between 1960 and 2000, and cotton production in the region nearly doubled in the same period.

The Government of Tajikistan intends to cooperate with its neighbors to reduce threats to international waters. In November 2014, Tajikistan and Afghanistan signed a memorandum of understanding to formalize the sharing of water data between the two countries.

Extreme climate conditions with low precipitation or extremely low temperatures in winter and spring occurred in 2000, 2001, and 2008. These conditions led to a reduction of water supply to the Nurek hydropower plant. In 2002, Tajikistan faced a dry year and allowed a huge discharge of water from the Nurek reservoir to maintain the agricultural lands downstream in Uzbekistan and Turkmenistan who share the Amudarya basin. In exchange, these countries covered the power generation deficits experienced by Tajikistan by increasing energy exports. The winter between 2007 and 2008 was extremely cold, with air temperatures reaching –30 degrees centigrade. This led to a significant reduction of water flow to the Nurek reservoir. At this time the grid power load increased, while the volume of power generation reduced, resulting in economic losses.

The demand for cheap and green energy, and the need to construct new hydropower plants and reservoirs, are increasing. Given the climate change-related trends and the speed of socioeconomic development, energy-related problems in Tajikistan and neighboring countries will grow if projects of regional importance are not implemented and if measures on integration and diversification of energy systems are not undertaken.

The Government of Tajikistan is planning to resume construction of a big reservoir at Rogun (total volume 12,400 cubic kilometers, exploitable volume 8,700 cubic kilometers). The future hydroenergy production at this reservoir will be used mainly to satisfy the higher energy demand of the economy including population, mining industry, and aluminum processing plant in Tursunzade.

Table B.7. GEF Projects and Alignment to International Waters and Global Environmental Benefits

GEF ID	Project name	Multi-state cooperation	Reduced pollution load in international waters	Restored and sustained water ecosystems	Reduced vulnerability to climate variability	Other GEBs
73	Water and Environmental Management in the Aral Sea Basin	☑☑ ^a	☑☑	☑☑	☑ ^b	LD/BD
830	Enabling the Republic of Tajikistan to Prepare its First National Communication in Response to its Commitments to the UNFCCC		☑	☑	☑	LD/BD/CC
1886	Climate Change Enabling Activity	☑	☑	☑	☑	LD/BD/CC
1928	National Capacity Needs Self-Assessment for Global Environmental Management (NCSA)	☑	☑	☑	☑	LD/BD/
2175	Support to the Implementation of the Regional Environmental Action Plan in Central Asia	☑	☑	☑	☑	LD/BD
2504	CACILM: Central Asian Countries Initiative for Land Management Multi-country Partnership Framework Phase 1	☑☑	☑	☑	☑☑	LD/BD
3230	CACILM: Multicountry Partnership Framework Support Project-under CACILM Partnership Framework, Phase 1	☑☑	☑	☑	☑☑	LD/BD
3231	CACILM: Multicountry Capacity Building Project	☑☑	☑	☑	☑	LD/BD
4160	Technology Transfer and Market Development for Small Hydropower in Tajikistan		☑	☑☑	☑☑	CC
4422	Increasing Climate Resilience through Drinking Water Rehabilitation in North Tajikistan	☑	☑☑	☑☑	☑☑	LD/BD/CC
5301	Enabling Country of the Transboundary Syr Darya Basin to Make Sustainable Use of their Ground Water Potential and Subsurface Space with Consideration to Climate Variability and Change	☑☑	☑☑	☑☑	☑☑	LD/CC
5903	Climate Adaptation and Mitigation Program for Central Asia	☑	☑	☑	☑	LD/BD/CC

Note: GEB = global environmental benefits, LD = land degradation, BD = biodiversity, CC = climate change.

a. ☑☑ - Indicates the project main objectives covering this GEB and was/will be a primary focus.

b. ☑ - Indicates main objectives covered by this GEB but with less focus.

5. Land Degradation

Global environmental benefits resulting from GEF's focus on land degradation specifically addressed issues concerning desertification and deforestation including:

- improving the provision of agro-ecosystem and forest ecosystem goods and services,
- mitigating/avoiding GHG emissions and increased carbon sequestration in production landscapes,
- conserving and sustainable use of biodiversity in productive landscapes,
- reducing pollution and siltation of international waters.

The Poverty-Environment Initiative study by the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) stated that “land degradation is a serious and growing global issue resulting in losses to GDP and local livelihoods, food insecurity, climate change, and biodiversity loss. Worldwide it is estimated to be responsible for a 3 percent to 5 percent loss in the affected countries' GDP. Land degradation is a major factor contributing to low agricultural productivity, the incidence of which is felt most keenly by the poor, whose livelihood is often dependent on agriculture” (UNDP–UNEP Poverty-Environment Initiative in Tajikistan 2012).

It further stated that “about one-fourth of the world's agricultural land, soil degradation is widespread, and the pace of degradation has accelerated in the past 50 years. The area of land subject to desertification and degradation is increasing each year driven by a number of factors including unsustainable land use, demographic changes, and growing water scarcity. These pressures are exacerbated by climatic changes and drought” (UNDP–UNEP Poverty-Environment Initiative in Tajikistan 2012).

Tajikistan's mountainous landscape is also difficult to cultivate: only 7 percent of the land is suitable for economic use and of this, only 18 percent is arable land. Nevertheless, agriculture remains the backbone of the economy, and the poor in particular depend on it for their livelihoods. The agricultural sector contributes around 18 percent of Tajikistan's GDP, and declining land quality impacts the country's economy by reducing productivity and/or higher production costs. Furthermore, the costs associated with land degradation directly affect the livelihoods of the rural communities. Thus, the quality of soil and irrigation is crucial.

Inefficient land management reduces agricultural output and threatens the income and food security of an already vulnerable population. Unfortunately, land degradation, mostly due to erosion, is becoming a pervasive problem in Tajikistan. According to the UNDP-UNEP study, “the country's topography has a strong influence on the types of crops that can be grown and also determines the type of machinery used, the method of soil irrigation, and the productivity of the land. Intensive agricultural activity on slopes inevitably results in erosion. Soils are washed out, and the development of ravines decreases the area of arable soils. Slopes up to 250 meters are widely cultivated without the implementation of any antierosion measures” (UNDP–UNEP Poverty-Environment Initiative in Tajikistan 2012).

While natural factors contribute to soil erosion, unsustainable human behavior accelerates the process to an intolerable degree. It is estimated that 97 percent of agricultural land in Tajikistan has some level of erosion. Land degradation caused from erosion due to overgrazing is estimated to affect approximately 3 million hectares or 85 percent of pastures. In addition, excessive use of pesticides and fertilizers has resulted in the contamination of soil and waterways.

“Although the extent of the problem is documented in Tajikistan's National Development Strategy 2007—15 and its Poverty Reduction Strategy (2010—12) (also called PRS3) adopted in February 2010, there has been

relatively little national scale analysis of the cost of land degradation to the national economy” (UNDP–UNEP Poverty-Environment Initiative in Tajikistan 2012).

The UNEP-UNDP Poverty-Environment Initiative study (2012) estimated the economic cost of land degradation associated with foregone production on degraded and unused agricultural land to be in the order of \$442 million (1,946 million Somoni) equivalent to 7.8 percent of Tajikistan’s GDP. However, the actual cost is likely to be much higher as it does not take into account the off-site costs of land degradation, such as damage to infrastructure. The study also reports that if the value of this foregone production was evenly distributed among rural households, each household would benefit by \$583 per year (based on an estimate of 757,608 rural households).

Most national and international experts consider pastures, haymaking areas, and natural forests as most affected by degradation. Based on findings in the final report of the Component A5: Phase 1 on Agriculture and Sustainable Land Management of the Tajikistan Pilot Programme for Climate Resilience (Wolfgramm and others 2011), the UNDP-UNEP study further states that

Haymaking areas are often not exclusively used for haymaking, but also for open grazing, and thus heavy degradation is widespread. Heavy degradation can be also observed along infrastructures such as roads and water canals. An estimated 90 percent of rain-fed cropland is believed to show signs of degradation, of which 40 percent is heavy degradation. Regarding irrigated cropland, 22 percent of the area is estimated to show heavy degradation, 38 percent light to medium degradation, and 40 percent no degradation. Degradation in forest plantations is estimated to affect around 70 percent of the area. Agroforestry systems are considered the least degraded, with heavy degradation occurring in 22 percent of the area, light to moderate degradation in 30 percent of the area, while the remaining 48 percent do not show any signs of degradation (UNDP–UNEP Poverty-Environment Initiative in Tajikistan 2012).

The erosive processes are especially active in the foothill regions where poorly cemented sandstones, loess such as loams, and similar rock dominate, lending themselves to washing out and wind erosion. The two main factors underlying the process of soil degradation in Tajikistan are water erosion and gully erosion. However, anthropogenic factors accentuate the erosive processes through intensive development of agriculture on slopes and unsustainable cultivation practices.

Based on the Tajikistan: Issues and Approaches to Combat Desertification report (Saigal 2003), the UNDP-UNEP study concluded that

The incidence and causes of soil degradation vary across the country, depending on natural features, climate, and land use. In the south of motley low hills, there are small sites of unfixed sand and zones of strong degradation (for example in Karadum and Kumjalolkum). Above these zones there are semi-fixed sands and areas of weak and medium degradation. Among the sandy massifs there are raised areas that are strongly subjected to water erosion. In the limits of Yavan, Gozimalik, Vakhsh, and other districts, there are sites of different degrees of erosion, mainly caused by water. In the limits of irrigated zones, a wide variety of erosion processes are at work. On the slopes of the mountain ranges (Babatag, Aktau, Karatau), a number of sites face water erosion to varying degrees (UNDP–UNEP Poverty-Environment Initiative in Tajikistan 2012).

Table B.8. Distribution of Soil Erosion

Administrative districts and provinces	Degree of erosion (%)					
	Non-eroded	Weakly eroded	Middle eroded	Strongly eroded	Very strongly eroded	Common area
Kurgant'yube group of districts	3.2	18.8	51.8	18.0	8.2	96.8
Kulyab group of districts	2.0	14.0	43.0	26.4	14.6	98.0
Sughd province	2.8	4.5	58.6	22.0	12.1	97.2
Hissar group of districts	4.3	9.4	40.2	31.5	14.6	95.7
Garm group of districts	0.5	4.2	35.1	32.9	27.3	99.5
GBAO	–	4.2	32.8	37.8	25.4	100

Source: Saigal 2003.

Note: GBAO = Gorno-Badakhshan Autonomous Oblast.

The UNDP–UNEP Poverty-Environment Initiative in Tajikistan study (2012) reported that

According to the Soil Research Institute in the Ministry of Agriculture, 60 percent of the irrigated territory in 1996 suffered from water erosion. The UNEP-UNDP Poverty-Environment Initiative study states an estimated 97 percent of farmed lands in Tajikistan have been harmed by poor irrigation services and salinization. Inefficient use of water is attributable to:

- deterioration of storage and irrigation infrastructure involving water leakage,
- weak on-farm water management. In-field water use efficiency is often only around 20 percent and is rarely greater than 40 percent (due to the incorrect quantity of water used and/or water is applied inappropriately). Often field losses are not counted since there is no monitoring of water distribution and losses at the lower end of the system,
- primary and secondary salinization due to wind and water erosion,
- water-intensive cropping patterns,
- absence of regulatory incentives and disincentives to promote water conservation. Water charges are not related to volumes used and are only partially collected.

The main problems associated with irrigation on the supply side are: low river levels; silting up of the main and distributary canal sections thus reducing the useable discharge; excessive seepage losses from canals through cracked or broken linings or where repairs have been carried out with poor supervision using inferior materials; absence of working cross regulators so that efficient water distribution is not possible, that is serving different areas with different water demands on rotation; and power shortages (Saigal 2003). Erosion-control measures on irrigated lands have reportedly been put on hold because of a need for funds (UNDP–UNEP Poverty-Environment Initiative in Tajikistan 2012).

The study further highlights that

It is estimated that poor management of and an under-performing drainage infrastructure have caused salinization on 16 percent of Tajikistan's irrigated lands. Salinization has negatively impacted soil fertility. The Ministry of Water Resources and Land Reclamation estimates that salinization reduces cotton production by 100,000 tons per year (World Bank 2007). Rising water tables are also of concern. It is estimated that groundwater levels of three meters or less from the surface characterize nearly 30 percent of all irrigated lands. Lands in Sughd region are in the most advanced stages of land degradation due to combined problems of salinization and high water tables. The box below discusses the links between

water management and land degradation in Tajikistan (UNDP–UNEP Poverty-Environment Initiative in Tajikistan 2012).

Box B.2. Water Management and Land Degradation

The main cause of land degradation in the valleys (lowlands) is considered to be the uneconomic use of water. The climate in Tajikistan is warm and dry in summer and crop agriculture is heavily dependent on irrigation.

The irrigation and drainage infrastructure is based on large-scale systems built during the Soviet period 1930–80. The area under irrigation increased from 450,000 hectares in 1960 to 700,000 hectares in 1990; and stabilized around 720,000 hectares. The system is complex, there are about 515 pumping stations; minor and major irrigation canals with a total length of 26,194 kilometers; 8,320 kilometer long various drainage line and facilities; 1,823 ameliorative and irrigation wells; 377 substations and 146 kilometers of power transmission lines; 10 water reservoirs for irrigation and energy-supply purposes; and other auxiliary infrastructure. Although river water is abundant in Tajikistan it does not always reach the agricultural end-users due to the degraded irrigation infrastructure. About 60 percent of irrigated lands are served by gravity irrigation systems with hydrotechnical constructions built in the middle of the past century, half of which are now physically worn out. The technical condition of pumping stations' penstocks is of serious concern. They have been used for over 40 years and more than half of them are not working and need replacing.

The social and economic consequence of pump systems failing is extreme due to the high cost of repair and maintenance. The majority of irrigation systems are managed by farmers, who do not have the finances to maintain them. Approximately 50 percent of drainage canals have not been cleaned for 20 years, resulting in groundwater degradation. While donor supported pilot studies have been successful, the benefits are temporary as after five years the canals need cleaning again. This highlights the need for long-term funding and planning (annual maintenance budget). Before 1990 the government received \$250 million a year to manage the system. Now they are allocated \$10 million from the state budget, which is intended to be supplemented by fees for water management service amounting to \$13 million (7 million Somoni) but actually only half of this is collected. In addition, it is estimated that around \$600 million in capital investment is required to restore the irrigation system to its pre-1990s standard.

After payment for water supply was introduced in 1996, the reliability of water intake and water supply records has significantly decreased. Consequently, while the total area of irrigated lands increased by 3.3 percent from 1996 to 2008, water users report water intake decreased by up to 30 percent. Furthermore, the overwhelming majority of farms (about 35,000) do not have the means to keep water records, and this causes difficulties in payment for water supply services. Out of 5,200 water delivery points (former collective and state owned farms), only 38 percent are nominally equipped with water metering devices.

There are 62,000 dekhkan farmers (but unofficially there may be more than 100,000 water users) more than 50 percent of which are unable to manage their water resources properly. It is common for people near pumps to take too much water. This in turn leads to waterlogging and leaves people further away from the pumps with too little water and subsequently low crop productivity. Water user associations are being promoted as a means of improving water management. These associations will be responsible for the management and allocation of water.

UNDP–UNEP Poverty-Environment Initiative in Tajikistan 2012.

Tajikistan's widespread land degradation will increase the sensitivity of the land to climate change impacts, while the implications of climate change for the agriculture sector and the role sustainable land management can play in climate change adaptation are considered to be highly significant for Tajikistan (Wolfgramm and others 2011).

Tajikistan signed United Nations Convention to Combat Desertification on July 16, 1997. The purpose of this multilateral environmental agreement is to combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.

The National Action Program to Combat Desertification was completed in 2001 and aimed to determine factors leading to desertification and the necessary measures to be taken to prevent and/or reduce the negative impacts of desertification and drought.

Furthermore, the Concept of Land Use in the Republic of Tajikistan was put in place in 2004. It also provides ground for afforestation and other erosion control activities in Tajikistan along with the Forestry Development Program of the Republic of Tajikistan for 2006—15.

Table B.9 GEF Projects and Alignment to Land Degradation and Global Environmental Benefits

GEF ID	ID and Name	Improved goods and services of agro- and forest ecosystem	Mitigate GHG emissions and increase carbon sequestration in production lands	Sustainable use of biodiversity in productive lands	Reduce pollution and siltation of international waters	Other GEBs
73	Water and Environmental Management in the Aral Sea Basin	<input checked="" type="checkbox"/> ^a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> ^b	IW/BD
830	Enabling the Republic of Tajikistan to Prepare its First National Communication in Response to its Commitments to the UNFCCC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
1854	Biodiversity Conservation and Sustainable Development in the Gissar Mountains of Tajikistan	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		BD/CC
1872	Community Agriculture and Watershed Management	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		BD/CC
1886	Climate Change Enabling Activity (Additional Financing for Capacity Building in Priority Areas)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
1928	National Capacity Needs Self-Assessment for Global Environmental Management (NCSA)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
2037	Dashtidzhum Biodiversity Conservation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		BD/CC
2175	Support to the Implementation of the Regional Environmental Action Plan in Central Asia	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
2504	CACILM: Central Asian Countries Initiative for Land Management Multi-country Partnership Framework Phase 1	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
3129	Sustaining Agricultural Biodiversity in the Face of Climate Change	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		BD/CC
3211	Support for the Implementation of the National Biosafety Framework of the Republic of Tajikistan	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		BD/CC
3230	CACILM: Multicountry Partnership Framework Support Project-under CACILM Partnership Framework, Phase 1	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
3231	CACILM: Multicountry Capacity Building Project	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
3234	CACILM: Rural Development Project under CACILM Partnership Framework, Phase I	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
3237	CACILM: Demonstrating Local Responses to Combating Land Degradation and Improving Sustainable Land Management in SW Tajikistan-under CACILM Partnership Framework, Phase 1	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
3310	Environmental Learning and Stakeholder Involvement as Tools for Global Environmental Benefits and Poverty Reduction	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
4352	Environmental Land Management and Rural Livelihoods	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		BD/CC
4422	Increasing Climate Resilience through Drinking Water Rehabilitation in North Tajikistan		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	IW/BD/CC
4694	Support for the Revision of the National Biodiversity Strategy and Action Plan and Development of Fifth National Report to the United Nations Convention on Biodiversity	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		BD/CC
5236	Strengthening Capacity for an Environmental Information Management and Monitoring System in Tajikistan	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
5301	Enabling Country of the Transboundary Syr Darya Basin to Make Sustainable Use of their Ground Water Potential and Subsurface Space with Consideration to Climate Variability and Change	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	IW/CC
5903	Climate Adaptation and Mitigation Program for Central Asia	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	IW/BD/CC
6949	Conservation and Sustainable Use of Pamir Alay and Tian Shan Ecosystems for Snow Leopard Protection and Sustainable Community Livelihoods	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		BD/CC

Note: GEB = global environmental benefits, IW = international waters, BD = biodiversity, CC = climate change.

a. - Indicates main objectives cover this GEB but with less focus.

b. - Indicates main objectives covering this GEB and was/will be primary focus.

6. Chemicals and Waste

The GEF's long-term goal is to prevent the exposure of humans and the environment to harmful chemicals and waste, including persistent organic pollutants (POPs), mercury, and ozone-depleting substances (ODS) by reducing the production, use, consumption, and emissions/releases of those chemicals and waste. Global environmental benefits resulting from GEF's objectives in this area include

- protected human health and environment through the reduction and elimination of mercury use, the prevention of anthropogenic emissions, and releases of mercury and its compounds,
- protected human health and environment through the phase-out of production and consumption of ODS,
- reduced risks on human health and the environment through reducing and eliminating the production, use, and release of POPs and their waste,
- reduced risks on human health and the environment through sound management of chemicals and waste of global concern.

Tajikistan joined the Vienna Convention for the Protection of the Ozone Layer in 1996 and the Stockholm Convention on POPs in 2002. The Stockholm Convention entered into force on September 5, 2007. The Government of Tajikistan appointed the Committee for Environmental Protection to develop the initial National Implementation Plan to be endorsed and submitted by the Government to the Conference of the Parties to the Stockholm Convention and, with funding from the GEF and UNEP, it was submitted on November 11, 2007.

The Stockholm Convention was adopted in May 2001 with the objective of protecting human health and the environment from toxic and hazardous POPs. It entered into force on May 17, 2004 initially listed twelve chemicals as POPs. These were placed in three categories: pesticides (dichlorodiphenyltrichloroethane [DDT], aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene); industrial chemicals (polychlorinated biphenyls or PCBs); and industrial by-products (polychlorinated dibenzodioxins, and polychlorinated dibenzofurans). At the fourth meeting of the Conference of the Parties in May 2009, the convention was amended to include nine new POPs (Alpha hexachlorocyclohexane; Beta hexachlorocyclohexane; Chloredecone; Hexabromobiphenyl; Hexabromodiphenyl ether and heptabromodiphenyl ether; Lindane; Pentachlorobenzene; Tetrabromodiphenyl ether and pentabromodiphenyl ether; Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride). The amendments entered into force on August 26, 2010.

Pesticides, including those containing organochloric components and POPs, were delivered to Tajikistan in the 1980s and 1990s from other countries through the Republican Industrial Scientific Organization "Tajikselhozhimia" (till 1980 – "Tajikselhoztehnika"), an institution responsible for their appropriate storage, effective use, and reliable registration. Nowadays, POPs that contain pesticides are neither imported nor re-exported. The use of some POPs-pesticides in agriculture is forbidden: DDT since 1970; aldrin since 1973; dieldrin and chlordane since 1985; and heptachlor since 1992.

From 1965 to 1990, 7,000 tons to 14,000 tons of pesticides were delivered to Tajikistan. During this period, the volume and types of pesticides used changed significantly. For example, the volume of insecticide-acaricides used decreased from 11,100 tons to 1,700 tons, whereas the use of fungicides increased from 1,000 tons to 6,100 tons. The use of herbicides and defoliant also increased many times over. The fall in the use of insecticide-acaricides was a result of the fall in the use of organochloric pesticides, the imports of which to Tajikistan were stopped in the mid-1990s.

The current availability of obsolete and forbidden pesticides are of great concern for human health and the environment. During the Soviet period, businesses imported pesticides but often up to twice their needs. As a

result, large volumes of pesticides are kept in storage facilities including Tajikselhozhimia, the Republican Productive Scientific Organization. Additional factors that contribute to problems associated with stocking large amounts of obsolete chemicals include:

- health care agencies prohibited the use of formerly purchased preparations due to increased toxicological and ecological risk,
- inefficiency of chemical application,
- long term storage of pesticides was terminated,
- containers were unpractical in terms of both size and quality,
- packages broke due to age,
- unsuitable preparative form,
- low stability of preparations during their storage,
- inefficient organization of storage and registration.

Some of the pesticides stored have been distributed to private farmers for use on their farms or have been secretly buried and thrown in dumps. Such distribution and dumping have not been controlled.

As a result of the initial inventory, 17.6 tons of DDT (including 17 tons of illegally imported in 2005–06) were discovered in the Sugd region. Another 0.55 tons were found in two households in the Gissar district. In storage facilities, 42.1 tons of unfit pesticides were found in packaging that had been destroyed because they were kept too long, as well as 100 tons of unknown pesticides containing DDT and metabolites with POP properties. Thus, the volume of forbidden, obsolete, and unknown pesticides to be repackaged and eliminated, is around 160.1 tons.

Tajikistan has taken many steps to implement the Stockholm Convention through legislation, regulations, programs and standards, policies, and other related measures, including actions by authorities and the public. Tajikistan has also prohibited the production and use of chemicals listed in annex A, article 3, paragraph 1(i) of the convention.

The ecological safety and use of chemical substances, including POPs, are regulated by state legislative acts and normative-methodical documents. The following legislative tools had an impact on the use of POPs:

- The Law on Environmental Protection (2011) and its complementary legal acts. These include laws on public health protection, atmospheric air protection, ecological expertise, the water code, production and safe handling of pesticides and agrochemicals, soil conservation, production and use of waste, ensuring sanitary and epidemiologic safety, quality and safety of foodstuffs, licensing of certain kinds of activity, environmental monitoring and environmental audit.
- The Regulation on Dangerous Chemicals. The regulation provides a framework for programs, policies, and principles regarding the control of production, packaging, storage, labeling, and handling of dangerous chemicals. It also establishes a dioxin/ furan limit value of 0.1 nanogram per cubic meter for hazardous, municipal, and clinical waste incinerators.
- The National Action Plan on Environment and Health Protection (2000). The plan was elaborated in accordance with the state health care strategy and the requirements of international conventions. It works jointly with other national programs and projects in the area of environmental hygiene including the Poverty Reduction Strategy, the National Program on Tropical Disease Control; and the Healthy Life Style Program of Tajikistan that will establish a database and monitoring system on environmental hygiene.

The policy on hazardous waste treatment and management in a transborder context is presented in the Law on External Economic Activity and the Law on State Regulation of External Trade. These laws oblige those conducting external economic activities to observe legislation of Tajikistan and international norms and rules. They also ensure the standards and safety criteria of those importing commodities (including hazardous wastes) and control their use once in the country.

Two interagency committees coordinate to improve mechanisms to control and regulate the use of chemical substances and protect the environment. The Interagency Committee on Chemical Safety analyses critical issues pertaining to sound management of these substances and prepares suggestions for the government to solve strategic problems concerning chemical safety; advise on requirements and improvement of mechanisms for treating chemical substances and biological preparations; and observation of normative and legislative acts on chemical safety. The committee has the right to approve, modify, and add to the list of chemical substances and biological preparations permitted for use in Tajikistan.. The Interagency Coordination Committee on Ecological Statistics is responsible for implementing the state strategy; controlling ecological statistics; elaborating methods for monitoring of ecological statistics; coordinating the criteria and evaluation of statistic ecological indicators; and characterizing the ecological condition.

Table B.10. GEF Projects and Alignment to POPs/ODS/Chemicals and the Global Environmental Benefits

GEF ID	Project name	Reduction and elimination of mercury use	Phase-out of production and use of ODS	Reduction and elimination production, use, and releases of POPs	Sound management of chemicals and waste	Other GEBs
15	Program for Phasing-out ODS		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> ^a		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	CC/BD
1928	National Capacity Needs Self-Assessment for Global Environmental Management	<input checked="" type="checkbox"/> ^b	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
1955	Enabling Activities for the Stockholm Convention on POPs: National Implementation Plan for Republic of Tajikistan	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	BD/CC
2175	Support to the Implementation of the Regional Environmental Action Plan in Central Asia	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
2331	Preparing for HCFC Phase-out in Countries with Economies in Transition (CEITs): Needs, Benefits, and Potential Synergies with other Middle East and African Countries		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	CC
3185	Continued Institutional Strengthening Support for CEITs to meet the obligations of the Montreal Protocol		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	BD/CC
3211	Support for the Implementation of the National Biosafety Framework of the Republic of Tajikistan	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		BD/CC
3310	Environmental Learning and Stakeholder Involvement as Tools for Global Environmental Benefits and Poverty Reduction	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/BD/CC
3614	Demonstrating and Scaling Up Sustainable Alternatives to DDT for the Control of Vector-borne Diseases in Southern Caucasus and Central Asia			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	CC
4102	Initial Implementation of Accelerated HCFC Phase-out in the CEIT Region		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	CC
4352	Environmental Land Management and Rural Livelihoods	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		BD/CC
5000	Lifecycle Management of Pesticides and Disposal of POPs Pesticides in Central Asian Countries and Turkey			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	CC
5223	Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on POPs			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	LD/CC
5236	Strengthening Capacity for an Environmental Information Management and Monitoring System in Tajikistan	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	IW/LD/BD/CC
6987	Protect Human Health and the Environment from Unintentional Releases of POPs and Mercury from the Unsound Disposal of Healthcare Waste in Tajikistan	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	LD/CC

Note: GEB = global environmental benefits, CC = climate change, BD = biodiversity, IW = international waters, LD = land degradation.

a. - Indicates main objectives covering this GEB and was/will be primary focus.

b. - Indicates main objectives cover this GEB but with less focus.

Appendix B.1. References

Republic of Tajikistan. 2011. *Tajikistan - Strategic Programme for Climate Resilience. Pilot Programme for Climate Resilience.* www-cif.climateinvestmentfunds.org/sites/default/files/meeting-documents/spcr_tajikistan_revised_012511_0.pdf.

———. 2003a. *First National Report on Biodiversity Conservation.* www.cbd.int/doc/world/tj/tj-nr-01-p01-en.pdf.

———. 2003b. *National Biodiversity Strategy and Action Plan.* www.cbd.int/doc/world/tj/tj-nbsap-01-p01-en.pdf.

———. 1988. *Red Data Book of Tajikistan.* Dunshanbe.

Republic of Tajikistan. State Administration for Hydrometeorology Committee on Environmental Protection under the Government of the Republic of Tajikistan. 2014. *Third National Communication of the Republic of Tajikistan under the United Nations Framework Convention on Climate Change.* http://unfccc.int/resource/docs/natc/tjknc3_eng.pdf.

United Nations Economic Commission for Europe (UNECE). 2012. *2nd Environmental Performance Review of Tajikistan.* ECE/CEP/163. www.unece.org/environmental-policy/environmental-performance-reviews/enveprpublications/environmental-performance-reviews/2012/2nd-environmental-performance-review-of-tajikistan/docs.html.

———. 2007. *Our Waters: Joining Hands Across Borders. First Assessment of Transboundary Rivers, Lakes and Groundwaters.* www.unece.org/fileadmin/DAM/env/water/blanks/assessment/assessmentweb_full.pdf.

United Nations Environment Programme (UNEP). 2005. *Global International Waters Assessment (GIWA): Aral Sea, GIWA Regional Assessment 24.* www.unep.org/dewa/giwa/areas/reports/r24/giwa_regional_assessment_24.pdf.

Saigal, S. 2003. "Tajikistan: Issues and Approaches to Combat Desertification." www.cawater-info.net/bk/water_land_resources_use/english/english_ver/pdf/tajiacd.pdf.

United Nations Development Programme (UNDP). 2012. *Capacity Assessment and Awareness Raising on Climate Change in Tajikistan.* www.iisd.org/pdf/2012/capacity_assessment_climate_tajikistan.pdf.

United Nations Development Programme-United Nations Environment Programme (UNDP–UNEP) Poverty-Environment Initiative in Tajikistan. 2012. *The Economics of Land Degradation for the Agriculture Sector in Tajikistan – A Scoping Study.* www.unpei.org/sites/default/files/dmdocuments/TJ_Economy%20of%20land%20degradation_ENG.pdf.

Websites

Climate Analysis Indicators Tool of the World Resources Institute. <http://cait.wri.org>.

Tajik Agency for Statistics. www.stat.tj.

United States Agency for International Development (USAID). www.usaid.gov/tajikistan/economic-growth-and-trade.

United States Department of State. www.state.gov/r/pa/ei/bgn/5775.htm.

UNESCO World Heritage Sites. www.unesco.org.

Technical Document C:
Progress Toward Impact – Case Studies

Table of Contents

Introduction	67
Case Study I: Biodiversity Conservation and Sustainable Development in the Gissar Mountains of Tajikistan Project	71
Case Study II: Community Agriculture and Watershed Management Project	87
Case Study III: Demonstrating Local Responses to Combating Land Degradation and Improving Sustainable Land Management in Southwest Tajikistan under the CACILM Partnership Framework, Phase 1 Project	96

Abbreviations

CACILM	Central Asian Countries Initiative for Land Management
CIG	common interest group
GEF	Global Environment Facility
UNDP	United Nations Development Programme

Introduction

As part of the evaluation, case studies were conducted on three GEF projects, namely: the Biodiversity Conservation and Sustainable Development in the Gissar Mountains of Tajikistan project (GEF ID 1854); the Community Agriculture and Watershed Management project; and the Central Asian Countries Initiative for Land Management (CACILM): Demonstrating Local Responses to Combating Land Degradation and Improving Sustainable Land Management in SW Tajikistan-under CACILM Partnership Framework, Phase 1 project (GEF ID 3237). The progress toward impact (P2I) methodology developed by the GEF Independent Evaluation Office was applied to the case studies.

Definition of concepts

Impact is defined as positive or negative, primary, and secondary long-term effects produced by an intervention, directly or indirectly, intended or unintended. This definition is used by the Development Assistance Committee Network on Development Evaluation of the Organisation for Economic Co-operation and Development (OECD-DAC 2002), the Evaluation Cooperation Group (ECG) of the International Financial Institutions, and the United Nations Evaluation Group (UNEG).

The goal of the GEF is to achieve environmental impact, which is defined as positive changes in biological, chemical, and physical parameters that could take the following forms:

- Stress reduction: decrease, prevent or slowdown the degradation, destruction, or contamination of the components of an ecosystem, for example better protection/enforcement, improved management effectiveness, banning of destructive technology, waste treated, habitats restored.
- Improved environmental status: positive changes in the state of the ecosystem or any of its components, for example improved water quality/ nutrient concentration, higher habitat cover, higher species population.

Over time, stress reduction leads to improvements in environmental status. Impact measurement thus has a time dimension, significantly longer than project duration, as many biophysical processes that the GEF aims to influence take a long time to mature—from 20 years to 30 years before an ecosystem is brought back to a healthy status, to 50 years before the ozone layer is restored. The time dimension is identified in terms of direct impact (changes attributable to an intervention, such as habitat restoration for a specific species, that have a quick impact [within a few years]) and long-term impact (changes emerging over time through long-duration biophysical processes).

Impact also has a space dimension; it can be measured at different geographical, socioecological, or administrative scales such as:

- at single sites or local administrative units and markets,
- at multiple disconnected sites, local administrative units, or markets,
- across landscapes or seascapes,
- across national, regional, or global markets,
- across national administrative units,
- across regions,
- worldwide.

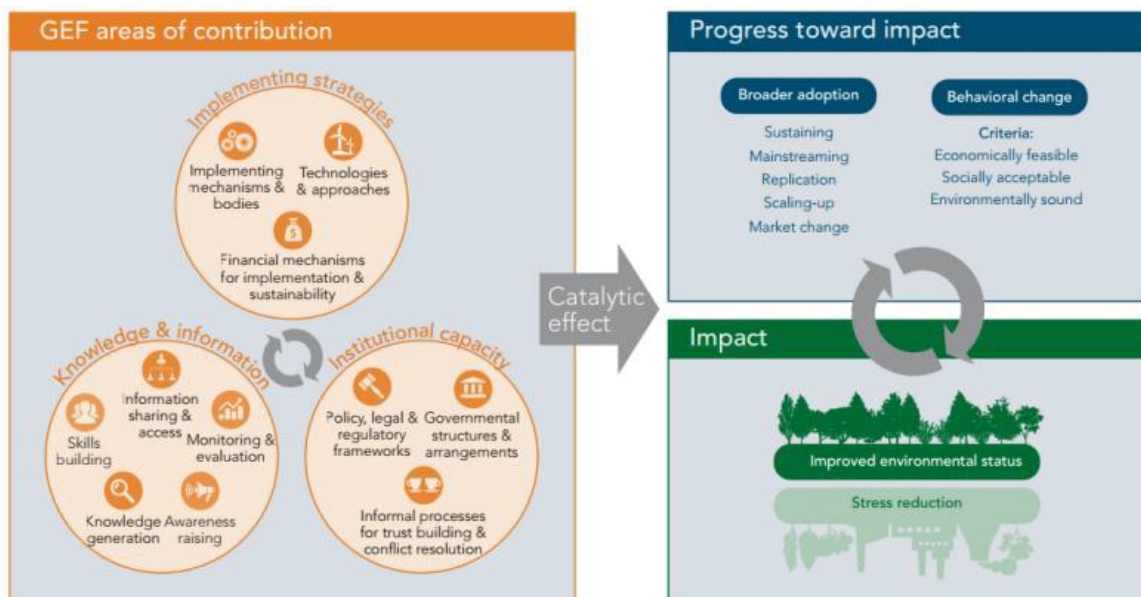
The GEF aims to influence socioeconomic processes to effect changes in biophysical systems (climate, biodiversity-rich ecosystems, sustainable land use systems, and so on). Large-scale impact, occurring at landscape, seascape, market, or higher scales is measured through both biophysical and socioeconomic parameters that identify the dynamics of the system. Large-scale changes tend to have no attribution as too many actors and processes of interaction occur, but may have identification of contribution.

Impacts may have local and global significance. Saving a unique local species has a global impact but also a local impact as well, as it may be a source of ecotourism income. Global significant impacts can have local impact as well, but not all local impacts have global significance. Social and economic impacts are studied to determine whether behavior changes reduce or enhance threats and whether they lead to sustainable development.

Although GEF support can aim at processes taking place at different levels (local, national, regional, or global), the aim is to transform the ways and systems by which humans interact with the environment. GEF contributions to such transformations typically take place through the broader adoption of the outcomes of GEF support by stakeholders through the following processes:

- Sustainability - interventions originally supported by the GEF continue to be implemented by stakeholders without GEF support to demonstrate the benefits and provide benefits for adoption by other stakeholders beyond the original project scope.
- Mainstreaming - information, lessons, or specific results of the GEF are incorporated into broader stakeholder mandates and initiatives such as laws, policies, regulations, and programs. This may occur through governments and/or through development organizations and other sectors.
- Replication - GEF-supported initiatives are reproduced or adopted at a comparable administrative or ecological scale, often in another geographical area or region.
- Scaling-up - GEF-supported initiatives are implemented in larger geographical areas, often expanded to include new aspects or concerns that may be political, administrative, economic, or ecological in nature.
- Market change - GEF-supported initiatives help catalyze market transformation by influencing the supply of and/or demand for goods and services that contribute to global environmental benefits. This may encompass technological changes, policy and regulatory reforms, and financial instruments.

Figure B.1 GEF Theory of Change



The GEF catalyzes progress toward impact by:

- 1) Promoting champions - developing the abilities of existing leaders to eventually take on more prominent roles, and consequently advocate GEF-supported technologies and approaches in other arenas (note: abilities refers to general leadership abilities/ opportunities rather than specific skills).

- 2) Building on promising initiatives - supporting components of existing initiatives that might otherwise not be supported by the original non-GEF funding sources.
- 3) Raising the profile of initiatives - attracting new cofinancing sources (in addition to the cofinancing sources identified in the original project document), implementation priority, and other forms of stakeholder support from governments and other stakeholders for existing initiatives.
- 4) Removing barriers - supporting components that enable the removal of specific obstacles that blocked further progress, or that prevented existing initiatives from moving forward.
- 5) Accelerating innovation - introducing or supporting new elements or concepts into existing management regimes (often already tested elsewhere by other actors), thereby dealing with their inherent risks and speeding up the adoption of these innovative elements that contribute to global environmental benefits, which some countries may otherwise implement much later.

Case Study C.I:

Biodiversity Conservation and Sustainable Development in the Gissar Mountains of Tajikistan Project

GEF ID	1854
Agency	UNDP
Focal Area	Biodiversity
Title	Biodiversity Conservation and Sustainable Development in the Gissar Mountains of Tajikistan
GEF replenishment phase	GEF-3 (2003—06)
Type	Medium-size project (MSP)
Status	Project Completion
Trust Fund	GEF Trust Fund
Executing partner / agency	CARE/Tajikistan
Type of executing partner / agency	NGO
Project preparation grant (PPG)	\$25,000
GEF Project Grant	\$975,000
Cofinance	\$745,000
Date of implementation start	January 3, 2006
Date of closure	December 31, 2011

A. Project Summary

Implemented by UNDP between January 2006 and December 2011, the Biodiversity Conservation and Sustainable Development in the Gissar Mountains Project of Tajikistan received a \$1 million grant from the GEF (during GEF-3 replenishment phase), and \$750,000 in cofinancing provided by the Government of Tajikistan and other donors, for a total of \$1.75 million.

The Gissar Mountains was selected as the area of intervention for the project because of its significant global biodiversity values and its relatively close proximity to all three chosen protected areas namely the Romit Zapovednik, a strictly protected reserve maintained in its wild condition and used only for scientific research and education; the Almosi Zakaznik, a reserve managed for the conservation of particular biodiversity features, such as populations of rare plants or colonies of birds, where temporary or permanent restrictions may be imposed upon certain economic activities, such as logging, mining, grazing, hunting, and so on, and so forth; and the Shirkent Nature and History Park.

The project objectives included strengthening the management effectiveness and sustainability of the three different protected areas on the southern slopes of the Gissar Mountains, and thereby provide models and best practices replicable throughout the national protected area system.

The global environmental benefit to which the project was expected to contribute was catalyzing the improved conservation of globally significant biodiversity in Tajikistan through the demonstration of new mechanisms and approaches to effective management of protected areas and natural resources adjacent to them.

The project had three main components: policy reform to provide an appropriate enabling environment; effective management of protected areas, including provisions for their financial viability; and (development of sustainable and/or alternative livelihoods for communities living in close proximity to protected areas.

From July to September 2015, the project was reviewed using a methodology developed by GEF Independent Evaluation Office designed to assess progress toward impact. The evaluation team undertook the progress to impact assessment through desk reviews, fieldwork, stakeholder consultations, and verification in all four target jamoats. The evaluation team conducted in-depth interviews using standardized, semi-structured guides and questionnaire surveys with local government, civil society representatives, and project beneficiaries. GEF focal point staff, GEF Agency staff, and other government stakeholders were also interviewed.

B. Outputs and Outcomes

The project outcomes were identified as:

- a strengthened environmental governance that provides a more sustainable land-use context for the protected area system,
- new management practices are introduced and capacity built in target protected areas; overall management effectiveness and sustainability of the protected area system is improved,
- practical examples are provided to stakeholders on how to achieve environmentally sustainable livelihoods around target protected areas.

The project activities focused on the following outputs:

- The legal and policy framework for protected area management and enforcement is strengthened.
- The overall regulatory framework and enabling environment for biodiversity conservation and sustainable resources use in and around protected areas is strengthened and/or clarified.
- Participatory land use and natural resource management plans are effectively developed and piloted in the protected areas and their buffer zones.
- Technical knowledge and management capacity of the protected area staff is improved.
- Field conservation capacity of the protected areas is strengthened.
- Sustainable financing mechanisms is put in place for the three protected areas .
- Networking and exchange of best practices throughout the protected area system is established; replication of lessons generated by the project is ensured.
- Pilot sustainable natural resources options for reducing socio-economic pressures on natural resources in and around protected areas are demonstrated and long term support to sustainable development is facilitated.
- Alternative options for producing and conserving energy are clearly demonstrated helping to reduce use of fuel wood.
- Lessons are disseminated to relevant government authorities, NGOs, communities and development agencies aiming at facilitating follow up initiatives.

The terminal evaluation was completed in January 2012. It rated the relevance, effectiveness, efficiency, and impacts of achieving the project's objectives as satisfactory, moderately satisfactory, moderately satisfactory, and satisfactory respectively. The overall sustainability of the project's three outcomes was evaluated as moderately likely.

C. Environmental Change

The project has achieved its outcomes such as building capacity for protected area management and supporting establishment of regulatory and/or institutional frameworks in Tajikistan. However, in many cases, a protected area must be effectively managed and monitored for an extended period of time before it can be determined that

the targeted globally significant biodiversity has been conserved. During field visits, which included interviews with stakeholders, the team observed:

- A limited increase of reforested areas, contributing to contain wind and water erosion of the land. Land for bird habitats, such as the blackbird and wood pigeon, and animals, such as the forest dormouse, also increased.
- River banks were stabilized thanks to the trees planted along the river banks, contributing to reduce the risk of flooding.
- An increase in awareness of the importance of biodiversity preservation in local populations (based on interviews in Jamoat Resource Centers and meetings with stakeholders).
- The involvement of local people in the management and conservation of the environment, through the participatory land-use and management of forest resources. Awareness raising and involvement of the local population in the management and conservation of the environment through participatory land-use mechanisms and joint management of forest resources also contributed to stress reduction and improvement of the environmental status.

The close involvement of local governments, in particular the local branches of the land tenure, forestry, and environmental protection departments from the design stages of the project until its completion was a key contributing factor. The four community-based Jamoat Resource Centers supported by the project still continue to function in all target jamoats, years after project completion.

Environmental Change

Environmental change reported ^a	Details ^b	Sources of information	GEF factors contributing to change	Non-GEF factors contributing to change
Environmental status is improved at local level	Increase of reforested areas; however, it is noted that this change is limited.	Interviews and field visit	Joint forestry management, tree nurseries and gardens, river banks stabilization.	
Decrease in tree cutting	Introduction of energy saving and energy effective technology.	Interviews and field visit	Introduction of low-cost technologies in heat insulation and fuel efficient cooking/heating stoves.	
Reduced risk of flooding	Through the stabilization of river banks (planting trees along the river banks).	Interviews and field visit	River bank stabilization; decrease of wind and water erosion.	
Improved biodiversity conservation	Increased awareness of the importance of biodiversity conservation.	Interviews and field visit	Joint community forestry management and ecotourism; new legislation.	
Involvement of local people in the management and conservation of the environment	Through participatory land-use and management of forest resources.	Interviews and field visit	Joint community forestry management and ecotourism	Other UNDP initiatives (community development, jamoat resource centers)

^a Reduction of environmental stress, improvement of environmental status, or maintained status (implying reduced stress), whether intended or unintended.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit and scale of environmental concern being addressed.

D. Socioeconomic Change

Significant socioeconomic changes were observed during field visits. Microcredit facilities set up by the project have made a significant contribution not only to increasing the wellbeing of the population due to the involvement of a wide range of borrowers, but also supported the improvement of rural infrastructure and communications.

The team verified the following examples of microcredit funds supported by the project. In Sabo Jamoat of ShakhriNAV district the microcredit fund supports gardening, agriculture, animal husbandry, and trade. It provides loans from 1,000 to 4,000 Somoni with a credit rate of 3 percent per month for six months. Two greenhouses were created with the total area of one hectare for growing vegetables and berries that are still operational today. Additional jobs were created for sellers of agricultural and forest products, and medicinal herbs. In Hokimi village, an energy-efficient guest house was built that generates income. It is visited by up to 40 people per year and hosts the annual children's environmental camp in which children learn about existing regional environmental problems, but also about global issues. The microcredit fund is issuing its revenue grants of up to 5,000 Somoni each to low-income families.

In Rabot Jamoat of Tursunzade district the microcredit fund provides loans of up to 15,000 Somoni with pledge, and up to 5,000 without. The credit rate is 3 percent per month. More than 100 people have been introduced to a new way of grafting fruit trees (hawthorn, pear), which provides more stable and larger yields, and therefore an increase in revenues. This experience was applied to 500 households. Furthermore, 120 kilograms of walnut seed, which is superior in quality to local varieties, were purchased and distributed among 30 households that will increase revenue when they begin to bear fruits. An energy-efficient guest house and furnaces were also built. The microlending fund also rebuilt two bridges in the villages of Rabot and Rabot 2 from its own revenue.

In Honakoi KuhlJamoat of Hissar district the microcredit fund has reached more than 1,000 customers since 2009. It provides loans from 1,000 to 15,000 Somoni for up to one year with a credit rate from 2.7 percent to 3 percent. In terms of outcomes, a vineyard nursery was created; an old vineyard was sold and the arborvitae was purchased to be planted along the roads; about 60 people were supplied with walnut seeds; and a bridge was built that generated 5,000 Somoni for poor families.

In Romit Jamoat of Vahdat district the microcredit fund provides microloans from 1,000 to 6,000 somoni with a credit rate of 2.7 percent to 3 percent per month. More than 1,000 people have receiving funding, 30 percent of whom were women. The revenue generated from the microloans financed the setup of three arboretums, two apiaries, one hectare of garden and eight greenhouses. A guest house in Yavroz and two energy-efficient furnaces were also built. This experience is actively adopted and replicated by the local population. For example, they have created 10 gardens in Hushon village and four to five apiaries in Yaftrak village. Revenues generated by the microcredit fund could also be used in the future to build mud flow prevention facilities in Yavroz, Sorbo, and Hushon villages and grant poor families 1,000 to 5,000 Somoni.

.Socioeconomic Change

Socioeconomic change reported ^a	Details ^b	Sources of information	GEF-supported activities/factors contributing to change	Non-GEF activities/factors contributing to change
Positive socioeconomic impact – income generating activities	89 households in four target Jamoats were involved in a range of income-generating activities. 64 households in four target Jamoats were involved in improving the insulation of their houses and/or installing more efficient stoves for cooking and heating. Five guest houses in four target Jamoats were under construction, using low carbon footprint and energy efficiency principles.	Terminal evaluation (Phase 1, progress toward Impact)	Support microprojects leading to environmentally sustainable income-generation; introduction of energy saving and energy efficiency techniques; initiative of community-based ecotourism; initiative of joint forestry management; creation of microlending organizations.	

^a Income, education, health, community relationships, treatment of marginalized groups, gender roles, and so on, and so forth, whether intended or unintended.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit and scale of environmental concern being addressed.

E. Capacity and Governance Changes

The project focused its capacity building efforts on four Jamoat Resource Centers and conducted a number of environmental education activities both at the individual and institutional level that had a number of positive results. In Sabo Jamoat, 10 farmers have concluded landlease agreements with the local forestry department. A plan of joint actions was developed together with the district government. New agricultural crop techniques have been adopted by neighboring villages (for example farmers from Bahodur). The project also assisted in the creation of five common interest groups (CIGs) that facilitated learning and knowledge exchange, an expansion of areas of interest, and the dissemination of knowledge on various topics. About 2,000 women from Sabo Jamoat have benefited from ecological training and awareness raising activities, and a month-training specifically targeted to women leaders. All these activities are still being continued today by the Sabo Jamoat Resource Centers.

In the Rabot Jamoat of Tursunzade district, the project held seminars for the general public and schoolchildren on biodiversity, as well as trainings on forest management. Five lease contracts between forestry management and residents were signed, covering a total area of 1,500 hectares. Ten high quality information leaflets and brochures on the indicative species were issued and widely distributed. Women were trained specifically on the collection, drying, and processing of medicinal plants. The new knowledge, technology, and approaches were disseminated and it is used and replicated by people not directly targeted by the project.

In the Honakoi Kuhi Jamoat of Gissar district, environmental awareness among the population was raised through 100 training seminars held in 23 villages on ecology and global environmental problems. A series of theatre recitals on environmental topics were designed and performed in the jamoat. Women received training on methods for collecting, drying, processing, and proper storage of medicinal plants. The project involved staff from the jamoat, and district branches of emergency and forestry departments who participated in the seminars, thereby also increasing the capacity of government officials and other civil servants. In interviews trainees reported disseminating their knowledge through their work and even at meetings of the hukumat. Women benefited from training on home economics and sewing.

In the Romit Jamoat of Vahdat district, more than 400 people supported the initiative to change the status of the Romit reserve to a protected area, and participated in seminars to discuss the issue. More than 200 women received training in modern methods of collecting, drying, and storing of medicinal herbs. A methodology for counting trout and bear was developed. Today, the jamoat resource center continues developing environmental training guidelines for beekeepers and gardeners. Workshops and seminars are still being conducted as well, aimed at improving the knowledge of reserve staff and the involvement of the local population. The decision to allocate a hectare in the village to create a school-based pilot forestry was a big achievement in capacity building among schoolchildren. In addition, the Romit Reserve Museum was rebuilt and converted into an Information and Environmental Center in the Shirkent Nature and History Park in Sughd province.

The project was also instrumental in a number of institutional capacity building initiatives and results. A noteworthy example was the creation of an interministerial working group, facilitated by the chairman of the Committee on Legislation and Human Rights who is a member of parliament, to bring in the relevant legal and technical expertise and fast-track the process of drafting new legislation on protected areas and the Forest Code. A template designed by the project was used to develop management plans of protected areas outside the project area. The experience of participatory forest management has spread beyond the project sites to Roshtkala, Ishkashim, and Darvaz districts.

Change in Capacities for Achieving Environmental Benefits

Reported change in capacities ^a	Details ^b	Sources of information	GEF-supported activities/factors contributing to change	Non-GEF activities/factors contributing to change
Some cases of replication of new approaches to protected areas and biodiversity management in the Gissar Mountains	Demonstration activities on sustainable approaches to livestock and pasture management; community and joint management forestry initiatives; community-based tourism; and other appropriate and viable natural resource management initiatives identified in partnership with local communities such as beekeeping and small-scale agricultural schemes.	Terminal Evaluation (Phase 1, progress toward Impact)	Support provided for environment friendly approaches to pasture lands management, joint forestry management, ecotourism, tree nurseries, gardens, river bank stabilization, beekeeping, energy conservation, and so on, and so forth.	
Awareness raised on the importance of biodiversity conservation and its monitoring	96 protected areas and forestry units employees and 337 members of local communities attended various seminars and training sessions on monitoring target protected areas. Capacity was also developed in two other respects: among staff from 20 protected areas through repeated application of the Management Effectiveness Tracking Tool (METT), improving their understanding of what constitutes effective management; and among the legislature, members of parliament, the president's office and also the treasury, through working groups and other means of developing their understanding of protected areas and how to sustain ecosystem services. A partnership was entered into with Fauna & Flora International, who received funds from the Darwin Initiative to develop a national conservation training programme comprised of a series of six training modules on biodiversity conservation related topics (ecosystem services, management or protected areas, biodiversity monitoring, sustainable livelihoods, forest management, project planning, and management). Each module was delivered twice, with up to 15 trainees per course (that is total capacity of 180 places, of which at least 125 were filled). Although courses were open to anyone able to cover their own costs, some of the modules were tailored to meet at least specific interests of the project.	Terminal Evaluation (Phase 1, progress toward Impact)	Joint protected area land and forest management practice; skills building and awareness raising; trainings on subproject preparation in communities and CIGs	

^a Awareness, knowledge, skills, infrastructure, information management systems, and so on, and so forth.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit and scale of environmental concern being addressed; typically assessed through change in mass behavior (for example compliance with regulations, participation)/ institutional activities.

Change in Governance Architecture Enabling Achievement of Environmental Benefits

Reported change related to governance ^a	Details ^b	Sources of information	GEF-supported activities/ factors contributing to change	Non-GEF activities/ factors contributing to change
<p>Knowledge was used for management/ governance</p>	<p>Analysis of the distribution and conservation status of 1,486 species of endemic and subendemic vascular plants in Tajikistan showed endemics to be most numerous in the Gissar-Darvasian geobotanical region, corresponding to the Gissar Mountains and the Zeravshan region immediately to the north. The household survey provided the basis to design community development programs. A set of some 20 maps for the three demonstration protected area was developed.</p>	<p>Terminal Evaluation (Phase 1, progress toward Impact)</p>	<p>The protected area Management Plan developed in the frame of the project was used in the GEF project regarding the Dashtidzhum reserve;. Jamoat resource centers and NGOs involved in GEF funded projects actively participated and received grants from the Tajikistan Small Grants Program.</p>	
<p>New protected areas law and Forest Code adopted by presidential order in 2011</p>	<p>The relatively quick passage of the legislation was due to the establishment of interministerial working groups to fast-track the process, that is the 1993 Forest Code (revised version adopted on August 2, 2011); and 2002 Protected Areas Law replaced by the Law of the Republic of Tajikistan on specially protected natural areas (adopted on December 26, 2011). The legal and policy framework has been significantly strengthened as a result of this output. The new Forest Code, provides an overarching framework for conservation and sustainable management of forest biodiversity and other resources. It recognizes the ecosystem services, the function of forests, provides for joint management of forests by the state</p>	<p>Terminal Evaluation (Phase 1, progress toward Impact)</p>	<p>Financial, organizational, and expert support to the Working Group.</p>	

	and users, and permits funds from fee-based services and sales of forest products (including confiscated products) to be reinvested in forest management. The new Code is much more articulate, with terms clarified and, for example, new articles that specify types of forest lands and code violations.			
Creation of an interministerial working group, facilitated by a the chairman of the Committee on Legislation and Human Rights (a member of parliament) to bring in the relevant legal and technical expertise and fast-track the process of drafting new legislation.	Established in April 2008, the Working Group is comprised of six specialists from the Protected Areas Agency, Forestry and Hunting Agency and the Forest Institute, to develop subsidiary legislation for management of protected areas and forests (that is normative legal acts, such as regulations, directions, and instructions).	Terminal Evaluation (Phase 1, progress toward Impact)	Financial, organizational, and expert support to the Working Group.	A wide range of governmental, nongovernmental, and community-based organizations have been involved in the project from the outset. The project was conceived as an idea by local NGOs. It developed good, close relationships with many of its key stakeholders, resulting in some very effective formal and informal partnerships. These include interministerial working groups to address new legislation, resulting from Project Management Units (PMUs) close collaborative work with the chairman of the Committee on Legislation and Human Rights; cementing a strong bond between protected areas and respective Jamoat Resource Centers, enabling local communities to become involved in the management planning process; and bringing the multilateral fund into

				partnership with Jamoat Resource Centers to help promote its microloans.
Replication of lessons has been limited, albeit with a few good examples, such as the use of interministerial working groups to fast-track the changes in legislation needed to create the necessary enabling environment in support of project interventions, and the application of the management plan format to other protected areas.	The management plan format, approved by the Protected Areas Agency in June 2010, has been used as the basis to prepare management plans for other protected areas, specifically Tajik National Park (as part of the preparatory work for its nomination for World Heritage listing) and Tigris Balka Zapovednik (supported by the World Wildlife Fund [WWF]). The management plan of Dashti Djum Zapovednik is also likely to be revised in line with the new format.	Terminal Evaluation (Phase 1, progress toward Impact)	The plan, developed seven to eight years ago by a World Bank Group–GEF project has not been implemented. Management plans for the remaining 12 zapovedniks are due to be prepared using this model.	

^a Refers to decision making processes, structures, and systems, including access to and use of information; includes laws, administrative bodies, policy frameworks, trust-building and conflict resolution processes, information-sharing systems, and so on, and so forth.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit and scale of environmental concern being addressed; typically evidenced by enactment, implementation, and/ or enforcement of legislation and other binding agreements, and regular allocation of resources for implementation.

Negative or Absent Impacts

Negative change reported ^a	Details ^b	Sources of information	GEF-related factors linked to negative result	Non-GEF factors linked to negative results
Lack of systematic impact monitoring	This was due in part to: (i) weaknesses in the choice and application of the logical framework indicators; and (ii) the absence of any comprehensive reassessment of Management Effectiveness Tracking Tool (METT) scores for all protected areas to inform the midterm evaluation about progress achieved to date towards meeting the project's objective. Long-term monitoring work was discontinued following the midterm evaluation as the methods were considered flawed and many of the selected indicator species of uncertain value for management purposes. These were subsequently removed from the logical framework on the advice of the Chief Technical Advisor (CTA). Instead, the CTA proposed a simple monitoring manual be developed for use by protected area staff system wide	Terminal Evaluation (Phase 1, progress toward Impact)	None	Although the project has achieved its performance indicator for financing protected areas, with financing from the state budget having increased by 50 percent for the three demonstration protected areas; However, the budgets are inadequate to manage protected areas effectively or attract a new generation of graduates to consider a career in protected areas management. Furthermore, analysis of this indicator (financing of the Zapovedniks and national parks system in Tajikistan) shows that a 50 percent increase in the annual budget of a protected area such as Almosi (\$555) would have negligible impact if annual inflation (6 percent) and annual increments (20 percent) in staff salaries are taken into account. Inflation apart, the validity of an indicator set at a target that equates to an increase of 4.5 cents per hectare is unrealistic.

^a May refer to actual negative changes or to lack of improvements where change was expected, implying failure of interventions to achieve impact; includes both environmental and social impacts.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit and scale of environmental concern being addressed

.

F. Broader Adoption Processes

The GEF's objective to play a catalytic role was found to be a key element of the project strategy. However, there was only a large catalytic effect high at the local level. Broader adoption occurred mostly for outcomes 2 and 3. Outcome 2 focused on demonstrating effective management planning in the three target protected areas, so that the experience and best practices may be used across the protected areas system. Networking and exchange of best practices throughout the system has been among the main success stories of this project, especially in the replication of some initiatives generated by the project in other protected areas.

The piloting of a wide range of approaches to developing sustainable livelihoods in areas bordering protected areas under outcome 3 was intended to encourage communities to conserve the environment. The project demonstrated that it is possible to get benefits from the environment, without direct negative impacts, in a number of different ways, such as ecotourism, beekeeping, the sale of seedlings, and increasing productivity through conservation areas. All this stimulated some behavioral change of the local population.

Communities have generally shown more interest than local governments, especially in as far as the conservation and sustainable management of protected areas are concerned, mostly due to the lack of funding to manage conservation areas. Catalytic financing from the government and other donors has not been as forthcoming as expected and has been limited. Overall, some cases of broader adoption of outcomes through replication rather than mainstreaming have occurred at the local level.

Broader Adoption of GEF-Supported Interventions Leading to Global Environmental Benefits

GEF-supported intervention adopted ^a	Broader adoption process taking place ^b	Sources of information	GEF-supported factors/ activities contributing to broader adoption	Non-GEF factors/ activities contributing to broader adoption
<p>An interministerial working group was set up to draft new legislation, with the Jamoat Resource Centers and multilateral funds with their environmental and sustainable livelihood agendas, and the newly adopted standards and best practice in protected areas management and financial planning</p>	<p>These relationships, mechanisms, and practices have gone from strength to strength. There is everything to suggest they will outlive the project, develop further, and become more widely applied. However, even though there has been a noticeable improvement in current levels of financing protected areas by the state, in most cases this is inadequate for management. The project had a significant impact among the local communities through the jamoats, reinforced by microoan opportunities established by the multilateral funds and available via the Jamoat Resource Centers. The multilateral fund has been notably successful in establishing these revolving funds and it is likely that this financing mechanism can be sustained in the future.</p>	<p>Terminal Evaluation (Phase 1, progress toward Impact)</p>	<p>Financial and organizational support from the project.</p>	<p>Financing from the state budget increased by 50 percent for the three demonstration protected areas.</p>
<p>Lessons learned and experience gained from the project have been collated and disseminated in the form of guidance for others undertaking similar activities in Tajikistan</p>	<p>A book was produced and distributed to government agencies, universities, and schools in 2008 to raise awareness about Tajikistan's protected areas. Furthermore, the Committee for Environmental Protection publishes a regular newsletter and a national staff conference has been held annually since 2009. Both are reported to have been successful. There has been no substantive progress in developing an information system based on the geographic information system, as reported in the midterm evaluation. A set of some 20 maps for the three demonstration protected areas was developed.</p>	<p>Terminal Evaluation (Phase 1, progress toward Impact)</p>	<p>Replication of lessons generated by the project is ensured through: dissemination of lessons learned to relevant government authorities, NGO's, communities, and development agencies; development of monitoring protocols; community awareness and participation; publication of a regular newsletter; support to a national staff conference.</p>	<p>Little evidence of best practices and know-how were documented for replication purposes.</p>

^a Technologies, management approaches, financing instruments, implementing bodies, legal frameworks, environmental monitoring systems, skills training systems, and so on, and so forth.

^b Type of broader adoption process/es, stakeholders adopting the intervention, scale of change in relation to targeted area/ unit and scale of environmental concern being addressed, any environmental and social impacts beginning to emerge.

G. Contributing and Hindering Factors

Integrating long-term planning for biodiversity within the broader planning framework is essential for achieving successful implementation, broader adoption, and progress toward impact. Communication between local governments, civil society, and community based organizations, as well as with all stakeholders was a critical component in crafting a plan that is broadly supported by the administration for the protected areas.

Awareness raising and education on biodiversity conservation is another important contributing factor. It is a building block for sustainable biodiversity conservation. The following factor in order of importance for achieving broader adoption was the support provided by the project to the organization of workshops and conferences on project lessons .

Making the case for biodiversity through political endorsement and a receptive political and institutional environment has been crucial. The value of biodiversity areas and ecosystem services needs to be properly expressed, such as its value for tourism, water management, and ecosystem-based adaptation in the context of climate change.

Active stakeholder engagement has been an essential contributing factor, as it was good for project design. Highly relevant technology/approaches such as microcredit facilities that benefit local beneficiaries, participatory land-use, and forestry management have also been considered as contributing factors.

Management of all conservation areas must be adequately funded for the sustainable management of biologically diverse and sensitive areas. Adequate funding and various mechanisms are required to ensure the project gains momentum. Very limited follow-on funding from government was found.

Table C.1.1 Summary of factors affecting broader adoption and impact

Project-related factors		Context-related factors
Contributing factors	<ul style="list-style-type: none"> • Highly relevant technology/approach (microcredit facilities that benefit local beneficiaries, participatory land-use, and forestry management) • Broader adoption processes initiated using project resources (workshop/conferences held on project lessons) • Good engagement of key stakeholders (involving local people and governments in decision making) • Good coordination with/continuity of previous/current initiatives (lessons learned used) • Good project design • Adaptation of project to changing contexts • Extended implementation period (one-year no-cost extension) 	<ul style="list-style-type: none"> • Country support (cofinancing)
Hindering factors	<ul style="list-style-type: none"> • No activities to sustain momentum (no follow on funding from the government) • Poor project management (at early stages) • Insufficient time for implementation 	<ul style="list-style-type: none"> • Lack of other stakeholder support (donors, private sector)

H. Conclusion

The project has successfully met three impact drivers: stakeholder ownership and support, effective financial mechanisms, and adequate information flows. At the local level, ownership was developed through an increase in community socioeconomic welfare as a result of a particular intervention. Stakeholders have strong ownership of the process and are in fact transformed from stakeholders to results owners.

Although stakeholders have generally shown great interest, government ownership has been limited and has not been relevant to the conservation and sustainable management of protected areas. The project did not establish an effective financial mechanism that included a range of approaches, such as trust funds, markets for sustainable livelihoods, small grants programs, and incentives from and markets for certified products. As with stakeholder ownership, financial factors play important role at many different levels, from alternative income-generating activities for local communities to national government budgeting for competing development priorities.

The project used the Management Effectiveness Tracking Tool (METT) that records scores to questions that measure the progress of protected areas in achieving management effectiveness. The tool has been developed to provide a quick overview of progress in improving the effectiveness of management in individual protected areas and it provides data that could be useful as background information on impacts.

Overall Ratings

Environmental Impact

[X]	Rating	Description	Evaluator remarks
	High impact achieved	Occurrence of stress reduction or improvements in environmental status on a large scale (that is across the landscape/ seascape or market)	
X	Impact achieved	Occurrence of significant stress reduction or low scale improvements in environmental status (that is in specific or disconnected areas)	Field observation identified that the current level of environmental impact is not enough to fully address all factors putting pressure on neighboring protected areas, but may lead to improving environmental status at the local scale, that is environmental status is improved at local scale, but disconnected.
	Some impact achieved	Occurrence of significant stress reduction or improvements on a low scale (that is in specific or disconnected areas) but extent of impact not significant compared to the dedicated resources	
	No impact achieved	No positive environmental impact observed	
	Negative impact	Some negative impacts observed	
	Unable to assess	Available information insufficient	

Broader Adoption by Stakeholders of GEF-supported Initiatives

[X]	Rating	Description	Evaluator remarks
	Highly successful	Broader adoption of most GEF-supported initiatives taking place on a large scale (that is across a country, region, or market)	
	Mostly successful	Broader adoption of some GEF-supported initiatives taking place on a large scale; other initiatives also adopted but mostly at lower scales	
X	Successful	Broader adoption of GEF-supported initiatives taking place at low scales (that is within local administrative units or markets)	Cases of broader adoption were found at the low scale and a few cases even at large scales. Most of them can be considered replication rather than mainstreaming.
	Partially successful	Plans for broader adoption that are well-established with supporting resources and institutional framework in place, but mostly not yet implemented	
	Unsuccessful	GEF-supported initiatives not adopted or expanded on by stakeholders beyond project duration and resources	
	None	No significant broader adoption taking place (note: plans for broader adoption may exist but implementation unclear)	

Case Study C.II: Community Agriculture and Watershed Management Project

GEF ID	1872
Agency	World Bank
Focal Area	Multi focal area
Title	Community Agriculture and Watershed Management
GEF replenishment phase	GEF-3
Type	Full-size project
Status	Project Completion
Trust Fund	GEF Trust Fund
Executing partner / agency	Ministry of Agriculture and Rural Development
Type of executing partner / agency	Government
Project preparation grant	\$205,000
GEF project grant	\$4,500,000
Cofinance	\$13,300,000
Date of implementation start	November 25, 2004
Date of closure	April 30, 2011

A. Project Summary

The Community Agriculture and Watershed Management project was implemented by the World Bank Group between November 2004 and April 2011. The total budget for the project was \$18 million. It received a \$4.5 million grant from the GEF (during GEF-3 replenishment phase), and \$13.3 million in cofinancing from the Government of Tajikistan and other donors including the Mountain Societies Development Support Programme of the Aga Khan Foundation (\$100,000); UNDP (\$84,000); Welt Hunger Hilfe (WHH) (\$345,000); a separate World Bank Group-executed project on capacity building in geospatial analysis (\$160,000); and a DfID-funded rural vulnerability and resilience study (\$200,000).

The project objective was to build the productive assets of rural communities in selected mountain watersheds, in ways that sustainably increase productivity and curtail degradation of fragile lands and ecosystems.

The global environmental benefit objective was to protect globally significant mountain ecosystems by mainstreaming sustainable land use and biodiversity conservation considerations within agricultural and associated rural investment decisions.

The project was reviewed from July to September 2015 using the progress toward impact methodology. In-depth data gathering was conducted in four (of 39) target jamoats located in the Aini, Panjakent, Mastchohi Kuhi, and Tajikabad districts. The evaluation team interviewed representatives of local governments, civil society, and project beneficiaries using standardized, semi-structured guides and questionnaire surveys. Interviews were also held with the GEF focal point staff, GEF Agency staff, and government stakeholders.

B. Outputs and Outcomes

The core components of the project included rural production investments, institutional support and capacity building, and project management. Project activities focused on farm productivity investments, land resource management, and rural infrastructure. The Implementation Completion and Results (ICR) report was completed in

December 2012, one and a half years after the end of the project. The overall performance ratings are provided in table 1 .

Table C.II 1 ICR Ratings Summary

Performance rating by ICR	
Outcomes	Satisfactory
GEO outcomes	Satisfactory
Risk to development outcome	Moderate
Risk to GEO outcome	Moderate
Bank performance	Satisfactory
Borrower performance	Moderately Satisfactory

C. Environmental Change

The project contributed to reducing environmental pressure through the creation of gardens on terraces to help conserve the soil and prevent wind erosion. Fruit trees in the gardens just started entering in production which is benefiting the project beneficiaries. Power-saving technologies, such as solar heaters and driers and water mills, are estimated to save at least 260 thousand kilowatts per hour per year. Additionally, 25 microhydro units have been rehabilitated or established. All these measures reduced the pressure on environment.

The use of biological methods for plant protection as an alternative to chemical control in at least 210 hecatres and the establishment of more than 5,300 beehives helped revitalize an important economic activity. Informants also said these ecological processes were critical for agricultural productivity and biodiversity conservation in the long-term.

According to project documents, water saving technologies in irrigation in subprojects saved an estimated 250 cubic meters a year. An irrigation network covering 30 villages consisting of water supply pipelines of 550 households was repaired. This allowed for a more rational and efficient use of water for irrigation and household purposes while, at the same time, preventing water erosion and soil salinization, as well as reducing the use of pesticides and fertilizers.

Improvement of pastures and their effective control increased their productivity and natural restoration. The introduction of yak breeding reduced the pressure on pastures. Corrals built by the project on the summer pastures helped livestock conservation.

Environmental Change

Environmental change reported ^a	Details ^b	Sources of information	GEF-supported activities/ factors contributing to change	Non-GEF activities/ factors contributing to change
Sustainable land management	Project development objectives were achieved as indicated by the percentage of sustainable subprojects (85 percent) and by the area of project land now under sustainable land management (96,600 hectares).	Terminal evaluation (Phase 1, progress toward impact)	The global environmental benefit objective of integrating sustainable principles into agricultural and rural development decisions was achieved through the number of hectares under sustainable land management (96,600 hectares); integration of environmental monitoring and impact assessment into rural subprojects; through the replication of best practices to other areas of the country (over 9,000 trained).	
Preservation and documentation of live indigenous plant specimens	Several missions were conducted by the Institute of Botany resulting in the identification of over 300 endemic and rare plant species including fruit trees. The Institute also updated the Tajikistan Red Book with their findings.	Terminal evaluation (Phase 1, progress toward impact)	Financial and organizational support.	

^a Reduction in environmental stress, improvement in environmental status, or maintained status (implying reduced stress), whether intended or unintended.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit, and scale of environmental concern being addressed.

D. Socioeconomic Change

Significant socioeconomic changes were observed during field visits. Small grants for environmentally friendly economic activities were awarded to more than 5,000 beneficiaries. According to interviewees from the Urmetan Jamoat Resource Center, 220 such activities were designed after project completion. Some of them managed to obtain funding from other donors.

The project was implemented through community-driven development and CIG approaches, in a way to bring direct economic benefits such as sustainable livelihoods to the population while conserving the environment. These included beekeeping, blacksmith shops, livestock and yak development, poultry farming, greenhouse establishment, vineyards and plant nurseries, use of biogas and solar energy, horticulture, lemon, potato and annual crops growing, establishment of small enterprises for agricultural processing, among others. Besides the initiatives directly targeting environmental conservation by creating sustainable livelihoods, the project also supported the upgrading and reconditioning of rural infrastructure and communications. During field visits to Urmetan Jamoat of Aini district, the water supply pipelines built for 550 households were found to be still functioning.

Poverty, gender, and social inclusion were all part of the objectives of the project. Female participation in subprojects was also a main goal of the project and, in fact, over 40 percent of project beneficiaries were women. The community-driven development and CIG approaches piloted by the project for the first time in Tajikistan were replicated by a number of other projects, including the Gissar Mountains Biodiversity Conservation project. Greater social cohesion occurred through the sharing of experiences and interactions across Jamoats and watersheds.

Socioeconomic Change

Socioeconomic change reported ^a	Details ^b	Sources of information	GEF-supported activities/ factors contributing to change	Non-GEF activities/ factors contributing to change
Poverty impacts, gender aspects, and social development	Female participation in subprojects was also a main goal of the project and over 40 percent of project beneficiaries were women. Social development can be defined in this context as expanding participatory methods (community-driven development) in decision making through the CIG model. Greater social cohesion can also be claimed through the sharing of experiences and interactions across jamoats and watersheds.	Terminal evaluation (Phase 1, progress toward impact)	Introduction of new approaches such as community-driven development and CIG.	
Improved rural livelihoods	In 2010, the project won the World Bank Group award for “Improving the Lives of People in the Europe and Central Asia Region”. The project was recognized for its achievements in improving rural livelihoods, increasing agriculture production, improving land resource management including pasture improvement, rural infrastructure rehabilitation, and involving the rural population.	Terminal evaluation (Phase 1, progress toward impact)	Allocation of significant funds for rural infrastructure rehabilitation and development subprojects.	
Poverty eradication	The cumulative number of households in project areas that undertook rural investments was greater than 43,000 and of those 50 percent are now above the poverty line.	Terminal evaluation (Phase 1, progress toward impact)	Wider involvement of local population.	

^a Income, education, health, community relationships, treatment of marginalized groups, gender roles, and so on, and so forth, whether intended or unintended.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit, and scale of environmental concern being addressed.

E. Capacity and Governance Changes

Besides introducing viable options for bottom-up approaches to sustainable environmental and natural resource management, the project contributed to capacity building in a number of other ways. It supported the Institute of Botany of the Academy of Sciences in conducting a study on biodiversity in the watersheds and collected rare and endangered species of plants. The project set up 50 demonstration plots for agricultural crops and gardens, using the Farmer Field School approach. A series of trainings contributed to improve the skills of Jamoat Resource Center and CIG members. Shepherds were trained on sustainable pasture management. Women were trained on processing and storage of fruits and vegetables, dairy and livestock production as well as processing of wool, leather, and others. CIG leaders learned project design skills leading to the design of 220 subprojects after completion, some of which succeeded in sourcing out the necessary funding.

Change in Capacities for Achieving Global Environmental Benefits

Reported change in capacities ^a	Details ^b	Sources of information	GEF-supported activities/ factors contributing to change	Non-GEF activities/ factors contributing to change
Project awareness raising	Project awareness raising, for example meetings and workshops were attended by more than 70 percent of beneficiaries.	Terminal evaluation (Phase 1, progress toward impact)	Arrangement of adequate awareness raising and participation programs.	
Dissemination activities on experience and knowledge generated	Materials were prepared, published, and shared in several formats including a book on project achievements; project leaflets; several technical brochures with different topics; three radio programs; a 20-minute film about achievements in watersheds; published articles in the Republican newspaper and agriculture magazines. Materials distributed among ministries, agencies, research institutes, international, and national NGOs.	Terminal evaluation (Phase 1, progress toward impact)	Arrangement of an adequate knowledge management strategy.	
Farmer competitions	Awareness was raised on good practices that can be replicated extensively by small farmers for pasture management, efficient irrigation technologies, and integrated pest management.	Terminal evaluation (Phase 1, progress toward impact)	Arrangement of an adequate knowledge management strategy.	
Built local knowledge	At the local and watershed levels, through the participatory methods of the CIG model, the project built local knowledge of best practice not only in productive asset building, but also with business plans, fiduciary requirements, and environmental impacts.	Terminal evaluation (Phase 1, progress toward impact)	Arrangement of an adequate knowledge management strategy.	

^a Awareness, knowledge, skills, infrastructure, information management systems, and so on, and so forth.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit, and scale of environmental concern being addressed; typically assessed through change in mass behavior (for example compliance with regulations, participation)/ institutional activities.

Change in Governance Architecture Enabling Achievement of Environmental Benefits

Reported change related to governance ^a	Details ^b	Sources of information	GEF-supported activities/ factors contributing to change	Non-GEF activities/ factors contributing to change
Institutional change/ strengthening	<p>The project supported increased knowledge at the program management unit and government levels of how bottom-up approaches can be successful.</p> <p>Among other donors it demonstrated a new way of doing development in a country where a substantial proportion of the population live in rural areas and that local empowerment can improve livelihoods, if the will is there.</p>	Terminal evaluation (Phase 1, progress toward impact)	Multilevel capacity building approach. The model introduced through the project was completely new for Tajikistan. It was contrary to the humanitarian aid-type of development that rural communities and the donor community were used to. In this regard, institutional strengthening occurred at many levels.	
Government initiative to request further support, and linked to other programs	<p>A request letter from Deputy Prime Minister, and the official endorsement by the Committee on Environmental Protection were sent in support of the Environmental Land Management and Rural Livelihoods project, which was funded by the GEF and the World Bank Group. Although, rural investments under the project are designed to be sustainable, new financing would enrich the benefits from such investments to beneficiaries (that is depth) as well as replicate activities in new locations (that is scope).</p>	Terminal evaluation (Phase 1, progress toward impact)	Good relationships with all stakeholders lead to increase of the country ownership level.	

^a Refers to decision making processes, structures, and systems, including access to and use of information; includes laws, administrative bodies, policy frameworks, trust-building and conflict resolution processes, information-sharing systems, and so on, and so forth.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit, and scale of environmental concern being addressed; typically evidenced by enactment, implementation and/ or enforcement of legislation and other binding agreements, and regular allocation of resources for implementation.

F. Broader Adoption Processes

The project included arrangements within its design to facilitate replication, mainstreaming, and eventually scaling-up. Replication has been observed at the local level in all the jamoats visited by the evaluation team. On

average, two to three subprojects are being independently replicated in each village by individuals, resulting in an estimated 800 replications for the entire project. The most common cases of replication were observed in horticulture, beekeeping, woodlots, and poultry farms. It is worth noting the higher than planned in-kind contribution from beneficiaries, estimated at \$3.4 million, as reported by the ICR and confirmed through interviews with representatives of the GEF Agency as well as the Farmers Advisory Services of Tajikistan.

The Community Agriculture and Watershed Management concept and community-based approach was adopted by a large scale six-year IFAD project in Khatlon, targeting 18,000 households. This project has three main components that are similar to those of the CAWM project, namely: rural productivity investments; institutional capacity building of local structures; and project management. The IFAD project also set up similar grant approval committees and mechanisms for subprojects. Adoption of elements of the Community Agriculture and Watershed Management approach has been observed with other organizations, including the Mountain Societies Development Support Programme of the Aga Khan Foundation on natural resource management issues for village planning.

Broader Adoption of GEF-Supported Interventions Leading to Global Environmental Benefits

GEF-supported intervention adopted ^a	Broader adoption process taking place ^b	Sources of information	GEF-supported factors/ activities contributing to broader adoption	Non-GEF factors/ activities contributing to broader adoption
Replicable subproject models for small farmers	On average, two to three subprojects are being independently replicated in each village by individuals, with an estimated 800 replications for the entire project. The most common were in horticulture, beekeeping and woodlots.	Terminal evaluation (Phase 1, progress toward impact)	Creation of adequate mechanisms for learning and replication.	
Demonstration of community-driven development in Tajikistan contributing to IFAD's Khatlon Livelihood project and adoption by other organizations	The Community Agriculture and Watershed Management concept and approach was adapted for a large scale six-year IFAD project in Khatlon (18,000 households) focusing on rural productivity investments, institutional capacity building of local structures, project management with similar grant approval committees. Adoption of elements of the Community Agriculture and Watershed Management project's approach with organizations, for example natural resource management aspects by the Mountain Societies Development Support Programme of the Aga Khan Foundation for village planning.	Terminal evaluation (Phase 1, progress toward impact)	Creation of adequate mechanisms for learning and replication.	

^a Technologies, management approaches, financing instruments, implementing bodies, legal frameworks, environmental monitoring systems, skills training systems, and so on, and so forth.

^b Type of broader adoption process/es, stakeholders adopting the intervention, scale of change in relation to targeted area/ unit, and scale of environmental concern being addressed, any environmental and social impacts beginning to emerge.

G. Contributing and Hindering Factors

The design of the institutional structure and subgranting mechanisms clearly demonstrated a participatory approach whereby the ideas that came from individuals and the CIGs were instrumental in bringing together people and ideas. This was in contrast to the past approaches where most activities focused on humanitarian aid rather than support for environmentally friendly agricultural production. Ultimately, changing this perception and attitude became one of the most important challenges during the implementation process.

The project drew on the existing institutions, such as the Jamoat Resource Centers built through the UNDP Rural Reconstruction and Development Program, and reinvigorated them towards a new development goal. The centers continued their existing decision making capacity, but were transformed to act as a clearinghouse for CIG and village investments, identifying new sources of funding and facilitating clearances and registrations for subprojects.

Active stakeholder engagement has been an essential contributing factor to the project efforts. Key stakeholders directly involved in the project included village leaders and village members, women, local government representatives, and technical staff of the line ministries located primarily at the district level. NGOs provided technical assistance during the facilitation and proposal development phase at the village level and the Jamoat Resource Centers acted as decision-makers and comprised elected officials from the communities.

Awareness raising and training as a prerequisite before investment was integral to sustainability since local knowledge contained gaps in more modern and environmentally-sustainable techniques. For example, individuals participated in training of pasture management and animal husbandry by the Institute of Husbandry of Tajik Academy of Sciences and the Agrarian University of Tajikistan.

Not all the risks identified in the project document were addressed by mitigation measures. Institutional capacity was correctly identified as a significant risk at the outset. However, it may have been underestimated. Given the rather complex institutional framework to implement subprojects at the jamoat level, it might have been worthwhile to do a more thorough preliminary analysis to identify the potential constraints to the community-driven development model, and viable ways to address them.

Table C.II 2 Summary of Factors Affecting Broader Adoption and Impact

Project-related factors		Context-related factors
Contributing factors	<ul style="list-style-type: none"> • Highly relevant technology/approach (income generating subprojects, modern agricultural technology, and so on, and so forth) • Broader adoption processes initiated using project resources (workshop/ conferences held on project lessons) • Good engagement of key stakeholders (involving local people and communities in decision making) • Good coordination with/ continuity of previous/ current initiatives (lessons learned used) • Good project design • Adaptation of project to changing contexts 	<ul style="list-style-type: none"> • Country support (cofinancing) • Other stakeholder support (donors, private sector)
Hindering factors	<ul style="list-style-type: none"> • Risk identification 	<ul style="list-style-type: none"> • Lack of stakeholders institutional capacity

H. Conclusion

The three main successfully met impact drivers are stakeholder ownership and support, effective financial mechanisms, and adequate information flows. At the local level, ownership was developed through both socioeconomic and livelihood incentives provided to the communities.

The government requested many of the activities introduced by the Community Agriculture Watershed Management project through the Environmental Land Management and Rural Livelihoods project, jointly cofinanced through the PPCR and the GEF, be sustained and replicated. Modeled after Community Agriculture Watershed Management project, the Environmental Land Management project includes components on building rural productive assets and local knowledge management that support rural populations in planning, implementing, and managing rural investments.

Overall Ratings

Environmental Impact

[X]	Rating	Description	Evaluator remarks
	High impact achieved	Stress reduction occurring or environmental status improving on a large scale (that is across the landscape/ seascape or market)	
X	Impact achieved	Significant stress reduction occurring or environmental status improving at low scales (that is in specific or disconnected areas)	Field observation identified that positive environmental impact occurred at local scale
	Some impact achieved	Occurrence of significant stress reduction or improvements on a low scale (that is in specific or disconnected areas) but extent of impact not significant compared to the dedicated resources	
	No impact achieved	No positive environmental impact observed	
	Negative impact	Some negative impacts observed	
	Unable to assess	Available information insufficient	

Broader Adoption by Stakeholders of GEF-supported Initiatives

[X]	Rating	Description	Evaluator remarks
	Highly successful	Broader adoption of most GEF-supported initiatives taking place at a large scale (that is across a country, region, or market)	
	Mostly successful	Broader adoption of some GEF-supported initiatives taking place at a large scale; other initiatives also adopted but mostly at lower scales	
X	Successful	Broader adoption of GEF-supported initiatives taking place at low scales (that is within local administrative units or markets)	Cases of the broader adoption, most of which being replications, were found at local level
	Partially successful	Plans for broader adoption are well-established with supporting resources and institutional framework in place, but mostly not yet implemented	
	Unsuccessful	GEF-supported initiatives not adopted or expanded on by stakeholders beyond project duration and resources	
	None	No significant broader adoption taking place (note: plans for broader adoption may exist but implementation is unclear)	

Case Study C.III: Demonstrating Local Responses to Combating Land Degradation and Improving Sustainable Land Management in Southwest Tajikistan under the CACILM Partnership Framework, Phase 1 Project

GEF ID	3237
Agency	UNDP
Focal area	Land Degradation
Title	CACILM: Demonstrating Local Responses to Combating Land Degradation and Improving Sustainable Land Management in SW Tajikistan-under the CACILM Partnership Framework, Phase 1
GEF replenishment phase	GEF-3
Type	Medium-size project
Status	Project Completion
Trust Fund	GEF Trust Fund
Executing partner / agency	UNDP Direct Execution (Communities Programme)
Type of executing partner / agency	Multilateral
PPG(s)	\$25,000
GEF project grant	\$975,000
Cofinance	\$1,053,000
Date of implementation start	February 15, 2007
Date of closure	April 29, 2011

A. Project Summary

The project was a part of the GEF/ADB Central Asian Countries Initiative for Land Management (CACILM) and was the first sustainable land management project to be implemented in the Central Asia subregion. Within this context, the project goal was to contribute to “the improvement of the sustainability of arid climate irrigation land management in Tajikistan in order to safeguard the livelihoods and economic well-being of rural populations and the functional integrity of national ecosystems”. The project was specifically designed as a demonstration initiative, that is through local on-ground pilot activities, the project tested and demonstrated replicable ways in which rural farmers and communities can address key land degradation and livelihood problems.

The project was implemented in four jamoats of four districts (one per district) located in the southern part of the Khatlon Oblast (province) in south Tajikistan.

Project Objectives and Goals

The specific objective of the project was “[t]o demonstrate the potential to implement replicable sustainable land management initiatives at the local level in Tajikistan and to build the capacity of local structures to do this”.

The project’s actual implementation started in April 2007 and closed in December 2011. The total project budget was \$2,053,000, of which GEF contribution of \$1 million (\$25,000 was granted for project design through the

project development facility A (PDF-A) and \$975,000 for implementation. The national executing agency responsible for the project from the side of the government was the National Land Agency.

The project was reviewed using the project toward impact methodology described previously. The evaluation team undertook the progress to impact assessment through desk reviews, fieldwork, stakeholder consultation, and verification. In-depth data gathering was conducted in all four target jamoats and interviews were conducted using standardized, semi-structured questions and questionnaire surveys with local government, civil society representatives, and project beneficiaries as well as project staff from the executing agency.

B. Outputs and Outcomes

The project outcomes were for local government and civil society structures to develop the capacity and awareness to regulate, plan, and monitor sustainable management of irrigated land and that appropriate and viable local-level initiatives for improving sustainability of land and water management were tested and available for replication.

The first outcome was supported by the three outputs:

- 1) An increased awareness at all levels within the project area of land degradation and unsustainable land management issues
- 2) An increase in the regulatory and operational capacity of the jamoat (local district authorities) and civil groups (Jamoat Resource Centers and village committees) to manage the sustainability of land resources
- 3) The establishment and capacity development of Water User Associations to collaboratively plan and manage water and land more effectively

The second outcome was supported by four outputs:

- 1) The testing and demonstration of appropriate approaches and techniques to address immediate land degradation problems of land users
- 2) The increased technical and managerial capacity of dehqan farmers to sustainably manage land and water resources
- 3) The creation of replicable models for sustainable reduction of wind and water erosion
- 4) Dissemination of best practices and lessons learned regarding local-level approaches to improving sustainable land management

The expected outcomes of GEF-supported activities on sustainable land management included:

- Strengthening institutional and human resource capacity to improve sustainable land management planning and implementation to achieve global environment benefits within the context of sustainable development
- Strengthening policy, regulatory, and economic incentive frameworks to facilitate wider adoption of sustainable land management practices across sectors in a country that has to address multiple demands on land resources for economic activities, preservation of the structure and functional integrity of ecosystems, and other activities
- Improving economic productivity of land under sustainable management and the preservation or restoration of the structure and functional integrity of ecosystems

The terminal evaluation of the CACILM Sustainable Land Management project was completed one month after project completion in January 2012 (Hurst and Amirjanova 2012). The terminal evaluation rated the project as highly satisfactory and reported that it addressed the full range of issues associated with sustainable land management, from creating de facto protected areas through the sustainable use of forest resources and community forestry initiatives and repairing key parts of the infrastructure system, to crop diversification, appropriate and sustainable technologies such as biodrainage, shelterbelts, among others and reducing pressure on resources through fuel efficiency. The project also supported the organization and empowerment of local

governance institutions, civil society, and community-based organizations. The terminal evaluation indicated that the project focused more on process than results but did not explicitly conclude whether either of the two outcomes were achieved. It concluded that sustainability of interventions was not guaranteed, nor was there guarantee that any catalytic effects would occur.

C. Environmental Change

Achievements at project completion stage

During fieldwork in the project sites (July-August 2015) and interviews with project stakeholders and beneficiaries, the evaluation team found that positive environmental changes seen at the end of the project were a result of:

- jamoat level joint planning and development to reduce land degradation,
- improved agricultural and water management practices to reduce land degradation,
- erosion control through forestry and tree planting,
- decreased pressure on forests through energy efficiency and energy alternatives.

Specifically, the project supported the creation of protected areas through sustainable use of forest resources and community forestry initiatives. Biodiversity was recovered as a result and, for example, the variety of birds and animals has significantly increased due to the preservation/protection of 126 hectares of Tugai forests through the Tugai Community Forest Management experience in Nuri Vakhsh Jamoat of Jilikul district. The 25 hectares of saxaul plantation also produced good results with the seedlings growing up to two to three meters. Boundaries around 500 hectares of semi-desert territories were maintained and secured against cattle grazing by a forestry officer of the district forestry department in Jura Nazarov Jamoat of Shaartuz district.

Unfortunately, the field observations identified that the Tugai Forest is under the risk of extinction since the five-year Agreement signed in 2008 between the three local communities and the hukumat expired in 2013 and no further efforts have been made for its renewal. The leasehold agreement for the 126 hectares of Tugai forest was structured as three different agreements, valid for five years, between village committees each represented and signed by a single leaseholder and the hukumat.

During the field visit, the evaluation team learned that of the three leaseholders, one had migrated to Russia while the other two were voluntarily by their own initiative and without any official authorization, trying to protect the Tugai forest from illegal cutting and cattle grazing. Due to limited financial resources, the district forestry department cannot hire forestry officers to officially secure the Tugai forest on a full-time basis. The representatives from the district forestry department visit the Tugai forest only once a month. The leaseholders noted that it is quite difficult to approach the new staff of the hukumat to share with them their experience as they had done with the previous staff of the hukumat. A member of the Tugai Forest Protection Committee/leaseholder reported that this situation is hindering the negotiation of the renewal/or extension of past agreements.

The terminal evaluation noted that the strength of tenure or proprietorship that motivates the local community to invest their time and efforts in protecting the Tugai forest correlated directly to the duration of the agreement. The terminal evaluation also predicted that there would be no guarantee that the leaseholds would be renewed or that the state would not place unacceptable conditions on any further leasehold. It is also recommended that a new agreement with the Tugai forest management department in the hukumat be negotiated before the end of the project, even though the agreement had another two years to run. With the project completed, negotiating the renewal of the agreement under UNDP's facilitation would be the only opportunity to build on successes achieved thus far. The many technically viable off-the-shelf agreements that could be brought to the table, but none would be as useful as an agreement is negotiated between the local community and the hukumat. UNDP third party facilitation would result in the asymmetrical distribution of power in the relationship between the two parties

whereas the negotiations need to be oriented towards the development of second generation agreements with the full participation of local communities to ensure their interests and opinions are heard during the process.

Appropriate and sustainable technologies

A total of 27,500 seedlings were planted in the four districts. Commercial plantations of orchards on poor and abandoned lands were established in 27 hectares in all four target jamoats. Additionally, four small scale nurseries were established in one hectare each growing approximately 5,000 to 15,000. Shelterbelts were established in 9 hectares and biodrainage on waterlogged lands was established in one hectare. River/canal side trees were planted over one hectare to prevent bank erosion. The team visited shelterbelts that were replicated in Jilikul and Shaartuz districts, and farmers in the Jilikul district reported that they were convinced that the technology had increased the productivity of the land.

The midterm evaluation reported that planting trees for the biodrainage of waterlogged areas had been an innovative initiative that was effectively promoted by the project. It attracted attention and was appreciated by jamoat and hukumat authorities. According to the terminal evaluation, the use of trees for biodrainage as a means to improve waterlogged land appeared to be working, but time was needed to fully assess the effects of this on large areas of waterlogged land. In fact, during the field visits, the biodrainage component appeared to be no longer working because it was not economically profitable. In one of the targeted jamoat in Kumsangir district, the absence of stakeholder support both from local authorities and farmers meant trees planted in waterlogged land were pulled out to grow rice and corn as this is more profitable for farmers. On average, they can harvest four tons of rice per hectare that they can sell on the local market at the price of 3 Somoni per kilogram.

Reduction of pressure on resources through fuel efficiency

About 40 energy efficient stoves in the four targeted jamoats and a small scale hydropower station in the Nuri Vakhsh Jamoat of Jilikul district were constructed with support from the project. Unfortunately, during the field visit the stoves were seen to be hardly used because local users did not have the expertise to use the new technology. In the Qum village of the Jilikul district, participants in the training to construct and efficiently use the stoves were mainly men. Language barriers played also a role as the village is located in a remote area where the inhabitants are ethnically Uzbek and do not speak Tajik at all. In fact, the national members of the evaluation team had to conduct the field interviews with an interpreter.

The five kilowatt generator unit that provided electricity to 14 households in the Qum village was not working at the time of the field visit, having been damaged by mudflow the previous summer. Households were unable to allocate enough funds to replace or repair the spare parts of the generator. At the time of terminal evaluation mission, the generator had been in use and very much valued by the community.

Environmental Change

Environmental change reported ^a	Details ^b	Sources of information	GEF-supported activities/ factors contributing to change	Non-GEF activities/ factors contributing to change
Some. The use of trees for biodrainage as a means to improve waterlogged land appeared to be working well but time was required to fully assess the effects of this on large areas of waterlogged land		Terminal evaluation (Phase 1, progress toward impact)		
None. The trees for biodrainage component were no longer in place	In the Kumsangir jamoat the lack of stakeholder support (local authorities at hukumat and jamoat levels and farmers) meant the trees planted for biodrainage in waterlogged land were pulled out to grow rice	Field trips, and interviews (July 2015)	Inappropriate/insufficient approach with and poor engagement of key stakeholders	

^a Reduction in environmental stress, improvement in environmental status, or maintained status (implying reduced stress), whether intended or unintended.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit, and scale of environmental concern being addressed.

Negative or Absent Impacts

Negative change reported ^a	Details ^b	Sources of information	GEF-related factors linked to negative result	Non-GEF factors linked to negative result
Very fragile gains were achieved by the project and there were considerable vulnerabilities as a result of likely future events	The project was coming to an end at a time when there was considerable uncertainty that was outside the control of the project. It placed enormous stress on the system and required considerable planning and management by the local administration.	Terminal evaluation (Phase 1, progress toward impact)	None	Returning migrants, increasing fuel prices, uncertainties with neighboring countries were cited as unforeseeable challenges

^a May refer to actual negative changes or to lack of improvements where change was expected, implying failure of interventions to achieve impact; includes both environmental and social impacts.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit, and scale of environmental concern being addressed.

D. Socioeconomic change

Activities to plant trees on poor and abandoned land and a greater emphasis on the commercial use of forestry generated much interest from both farmers and local authorities helping drive ideas into practical action. In particular, much interest was seen during the field visits when apricot, peach, and almond trees were planted in orchards that then became a valuable source of income.

The agricultural knowledge of private farmers, landless families, and rural unemployed women was considerably improved due to the establishment of four Farmer Field Schools in the targeted jamoats. Through the introduction of innovative farming practices and the provision of high quality seeds, local farmers were able to support their families and grow produce for the local market. This knowledge led to rational and efficient use of water and land resources, increased productivity, and improved economic wellbeing of the farmers.

Water User Associations were established in Kumsangir and Jilikul districts and the rehabilitation of some irrigation structures (gateways, water control gates) significantly improved the irrigation of lands and thus resulted in increased land productivity. The rehabilitation of one irrigation station in the Jura Nazarov jamoat improved the irrigation of around 300 hectares of land.

The project's microfinance work led to service loans to approximately 255 farming households, including 73 female-headed households. The microfinance program provided easy access and low interest rate loans to the farmers in all four target jamoats.

The terminal evaluation reported that participation by stakeholders was at the heart of the project. An example of this is the microfinance component. As recommended by the midterm evaluation, microfinance activities were moved from a regional to a local microfinance institution (that is from VakhshMicroFin to Rushdi Obshoron in Shaartuz district) that used the Land Degradation Units and consultants from the Farmers Field Schools as loan officers, legally paying for their services. However, during the field visits the team found that the Rushdi Obshoron was at risk of closure because of new requirements introduced by the National Bank of Tajikistan.¹⁴ Rushdi Obshoron has a capital of 2.5 million Somoni and was looking to merge with two other local microfinance institutions (Mehnatobod in Bokhtar district and Vorukh in Isfara district) to gain capital and avoid closure. Today, the Land Degradation Units and the Farmers Field Schools' consultants serve as loan officers at Rushdi Obshoron only in Jilikul and Qumsangir districts.

The terminal evaluation reported that women had an important role to play in sustainable land management, but that participation in activities such as the attending the Farmers Field Schools and access to microcredit was constrained by cultural barriers. The terminal evaluation further stated that there were 107 dehkan farms who were active clients of the project, of which fifteen were women (that is headed by a woman). The issue of low number of women can be explained by the limited number of dehkan farms that are officially headed by them. The project gave priority to women when granting microcredits, but few women made an application.

¹⁴ The new requirements were that microfinance organizations with the capital of less than 2 million Somoni were to close by October 1, 2015; microfinance organizations with capital of less than 3 million Somoni were to close by January 1, 2016; and microfinance organizations with capital less than 4 million Somoni were to close by April 1, 2016.

Socioeconomic Change

Socioeconomic change reported ^a	Details ^b	Sources of information	GEF-supported activities/ factors contributing to change	Non-GEF activities/ factors contributing to change
<p>Stakeholder participation in SLM activities was high</p>	<p>The microfinance programme was moved from a regional to a local microfinancing institution that used the Land Development Units and Farmers Field School consultants as loan officers and paid for the service. These staff are a crucial part of how the microfinance union operates and so are likely to continue to fulfill both functions post project.</p>	<p>Terminal evaluation (Phase 1 progress toward impact)</p> <p>Field visits and interviews (July, 2015)</p>	<p>Quick response to this challenge</p>	<p>At the time of the midterm evaluation, the regional microfinance institution was legally constrained from using the Jamoat Resource Centers as a service provider affecting the center's ability to continue with the Land Development Units, as well as making microcredit unaffordable due to raising interest rates.</p> <p>The regional microfinance institution was under threat of closure because of new requirements by the national bank.</p>
<p>Women's attendance of the Farmers Field School and participation in microfinance was hindered by cultural issues</p>	<p>A limited number of dekhan farms were officially headed by women meaning their attendance and participation was low. Women were a priority to receive microcredit grants through the project but few came forward to apply</p>	<p>Terminal evaluation (Phase 1 progress toward impact)</p>		<p>Gender relations, cultural norms</p>

Socioeconomic change reported ^a	Details ^b	Sources of information	GEF-supported activities/ factors contributing to change	Non-GEF activities/ factors contributing to change
<p>The project's microfinance work led to serviced loans to approximately 255 farming households, including 73 women-headed households</p>	<p>Generating microhydroelectricity was an interesting experiment and one that was largely carried out as a self-help exercise. The one unit that continues to work used parts that can be acquired easily in local markets and provides sufficient electricity (five kilowatts) to light 14 households. The distribution of fuel efficient stoves through the project appears to have worked well and provided financial savings to a household.</p> <p>Despite the fact that the demonstration of energy-efficient double-chamber furnaces focused on improving women's reproductive activities, the expansion of this activity has not continued. During field visits, examples of the widespread use of such furnaces were not observed. The new technology did not meet women's expectations.</p> <p>As a result of mudslides, the water level in the river rose by two to three meters damaging the mini generator that has since been stored in a barn by a farmer.</p>	<p>Terminal evaluation (Phase 1, progress toward impact)</p> <p>Field visit and interview (July 2015)</p>	<p>In some places only women were participated in practical trainings on the construction and use of efficient stoves (Kumsangir). In other places the majority of participants were men were (Shahrtuz, Kabodian, Jilikul districts). In one household in Jilikul the Nepalese oven is not used because the hole for firewood needed wood chopped in small amounts.</p> <p>Another respondent failed to properly install and use the oven (Kumsangir).</p>	<p>Gender relations, cultural norms, language constraints</p>

^a Income, education, health, community relationships, treatment of marginalized groups, gender roles, and so on, and so forth, whether intended or unintended.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit, and scale of environmental concern being addressed.

E. Capacity and Governance Change

Individual and institutional capacity strengthening occurred at different levels. Below are a few examples of the support to the organization and empowerment of local governance institutions, civil society, and community-based organizations.

The Farmer Field Schools targeted private dehkan farmers, landless families, and rural unemployed women and their families. Through the schools and effective work carried out under the forestry component, farmers became aware of possible solutions to land salinization, stopping of gullies, and managing irrigation water. The local consultants (irrigation, Farmer Field Schools and forestry) increased their skills and abilities and some of them continue to provide their services to local communities and local government either in their current capacity as extension workers or as private individuals. During the field visits to Shaartuz and Kumsangir districts, the Land Development Unit units were seen to still exist and provide, along with consultants from the Farmer Field Schools, individual consultation and advice to local farmers. Furthermore, a local dehkan farmers association was established to work on sustainable land management technologies. Baseline surveys were carried out at the beginning of the project on awareness and perception of land use issues as well as basic indicators on the status of land/degradation in the project area.

The establishment of the Tugai community-managed forest was an important development supported by the project. It marked a significant example of how to manage forests and provided valuable lessons for the development of community forestry in Tajikistan. However, as the leasehold arrangements were for five years and expired, communities are no longer investing in the Tugai forest because they have little security of tenure. Furthermore, there are numerous restrictions on what they can and cannot do with the forested areas. The security of tenure, and in particular the length of tenure, will directly affect the level of investment by the participating local communities in protecting the forest.

Change in Capacities for Achieving Environmental Benefits

Reported change in capacities ^a	Details ^b	Sources of information	GEF-supported activities/ factors contributing to change	Non-GEF activities/ factors contributing to change
Acquired skills in new agricultural technologies through the Farmer Field Schools	The project has had a significantly improved the skills of those who attended the Farmer Field Schools to those in the Land Development Units, in particular their capacity to carry out land use planning and represent their constituent's interests in the planning process.	Terminal evaluation (Phase 1, progress toward impact)	Trainings were conducted in the trainees' native language.	
A local dekhan Farmers Association was established working on the sustainable land management technologies	Baseline surveys were carried out at the beginning of the project on awareness and perception of land use issues as well as basic indicators on the status of land/degradation in the project area.	Terminal evaluation (Phase 1, progress toward impact) Observation and interviews with farmers (July 2015)	Due to expansion and many cases of replication of shelterbelts the productivity of land improved (Jilikul).	

^a Awareness, knowledge, skills, infrastructure, information management systems, and so on, and so forth.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit, and scale of environmental concern being addressed; typically assessed through change in mass behavior (for example compliance with regulations, participation)/ institutional activities.

Change in Governance Architecture Enabling Achievement of Environmental Benefits

Reported change related to governance ^a	Details ^b	Sources of information	GEF-supported activities/ factors contributing to change	Non-GEF activities/ factors contributing to change
Establishment of the Tugai community management forest	A five year leasehold agreement was negotiated with the hukumat and three participating villages. The five years have passed and the communities are not investing in the Tugai forest as they have little security of tenure. Furthermore, there are numerous restrictions on what they can and cannot do with the forested areas.	Terminal evaluation (Phase 1, progress toward impact) Field visits and interviews (July 2015)	Facilitated the conclusion of different off-the-shelf agreements	Tajikistan is in transition from a controlled and centralized economy to a relatively free-market economy. Neither of these two states readily recognizes common property to which the project initiative was essentially directed.
Communities are extremely concerned about their ability to protect the forest	One leaseholder went to Russia to work, the other two volunteer every 10 days to watch the forest. There is no interest on the part of the new leadership in the hukumat. Sometimes, the district department of ecology comes to check the forest. Tenants think that the new leadership in the hukumat is not willing to extend the agreement or to conclude a new one that gives them formal authority for the protection of forests.	Field visits and interviews (July 2015)	None	Lack of governmental support and cooperation between the community and hukumat.

^a Refers to decision making processes, structures and systems, including access to and use of information; includes laws, administrative bodies, policy frameworks, trust-building and conflict resolution processes, information-sharing systems, and so on, and so forth.

^b Before/ after, quantitative/ qualitative, scale of change in relation to targeted area/ unit, and scale of environmental concern being addressed; typically evidenced by enactment, implementation and/ or enforcement of legislation and other binding agreements, and regular allocation of resources for implementation.

F. Broader Adoption Processes

The CACILM Sustainable Land Management project helped develop a fledgling community forest management system and the inclusion of ecosystem resilience in the rural development agenda. The project operated in a context characterized by important structural changes in Tajikistan's policy context. Along with other donor supported initiatives, the project leveraged a number of far reaching reforms and legislation in the agricultural and water sectors, and some crucial follow up actions, including the dehkan farmers debt forgiveness initiative from so-called Future Companies debts, and the development of Water User Associations.

Many cases where the project initiatives have been replicated were found. For example, many farmers not involved in the project established tree shelterbelts on their land plots. The financing of extension services in the project have been studied with interest by UNDP and scaled up to other projects. The terminal evaluation found that the approach followed by project influenced the design of the UNDP rural development program being implemented in Soghd Oblast and the Zerafshan Valley. It will likely influence other future initiatives including, according to interviews with UNDP, a project funded by the United Kingdom Department for International Development (DfID) designed as a continuation of the existing programme. To note, the use of extension services have proved expensive in other areas and requiring continued external support.

G. Contributing and Hindering Factors

All project interventions were in line with the national policy agenda. The project was also consistent with the National Strategy for Combating Desertification (2002), the National Biodiversity Conservation Action Plan (2003), and the country's Poverty Reduction Strategy Plan (2002). At the level that the project was working, there was a genuine self-interest in ecosystem resilience that is likely to have provided strong motivation for local participation.

The CACILM Sustainable Land Management project collaborated with and complemented the Water User Association project. The Water User Association project operated at the scale of water units, whereas the CACILM Sustainable Land Management project was able to work at the level of groups of dehkan farmers.

The implementation of the proposed sustainable land management approach facilitated by the project built local capacities, and empowered the targeted communities to organize and resolve complex problems. Importantly, the idea that development, be it economic or social, must be founded on the ecosystem's ability to provide for society has been gradually introduced. The same for the idea that sustainable management of the ecosystem requires broad participation of all its users, with clearly understood levels at which decisions are made. In all project sites, communities and dehkan farmers participated in the decision making process through links with either the Farmer Field Schools, the Land Degradation Units, the Jamoat Resource Centers and jamoats themselves that are further linked to the microfinance program. Gender relations, cultural constraints, and language barriers are the main hindering factors in applying new technologies.

H. Conclusion

To achieve its impacts, the project needed to demonstrate replication of its innovative tools and approaches to sustainable land management. The project did this by testing new approaches

(institutional, technical, and financial) that were then made available for replication and upscaling by providing support and facilitation to local governance to resolve challenges derived from the historical system of land use and administration, and by introducing a number of appropriate technologies and methodologies for improving land and water management, and agriculture at the local level.

Stress reduction has occurred and even environmental status has been improved at the local level in some cases, hence the extent of impact is not significant. In some cases it is too early for real visible impacts, except at a micro and local level.

In terms of sustainability, it was observed during field visits that not all beneficiaries were able to use the new technology introduced by the project because of gender relations, cultural constraints, and language barriers. It was also observed in some separate cases that there was no local government support, meaning there was little cooperation between the community and the *hukumat*. Availability of funding was also an issue. The continuation of interventions and its expected catalytic effects are only potentially likely to occur.

Overall Ratings

Environmental Impact

[x]	Rating	Description	Evaluator remarks
	High impact achieved	Stress reduction occurring or environmental status improving at a large scale (that is across the landscape/ seascape or market)	
	Impact achieved	Significant stress reduction occurring or environmental status improving at low scales (that is in specific or disconnected areas)	
X	Some impact achieved	Occurrence of significant stress reduction or improvements on a low scale (that is in specific or disconnected areas) but extent of impact not significant compared to the dedicated resources	Stress reduction has occurred and even environmental status has been improved at local scales in some cases but extent of impact is not significant. In some cases it is too early for real visible impacts, except at a micro and local levels.
	No impact achieved	No positive environmental impact observed	
	Negative impact	Some negative impacts observed	
	Unable to assess	Available information insufficient	

Broader Adoption by Stakeholders of GEF-supported Initiatives

[x]	Rating	Description	Evaluator remarks
	Highly successful	Broader adoption of most GEF-supported initiatives taking place at a large scale (that is across a country, region, or market)	
	Mostly successful	Broader adoption of some GEF-supported initiatives taking place at a large scale; other initiatives also adopted but mostly at lower scales	
X	Successful	Broader adoption of GEF-supported initiatives taking place at low scales (that is within local administrative units or markets)	Cases of broader adoption in the form of replication were found at the local level
	Partially successful	Plans for broader adoption well-established with supporting resources and institutional framework in place, but mostly not yet implemented	
	Unsuccessful	GEF-supported initiatives not adopted or expanded on by stakeholders beyond project duration and resources	
	None	No significant broader adoption taking place (note: plans for broader adoption may exist but implementation unclear)	



Global Environment Facility
Independent Evaluation Office
1818 H Street, NW
Washington, DC 20433
USA