

Afghanistan

National Capacity Needs Self-Assessment for
Global Environmental Management (NCSA)
and National Adaptation Programme of
Action for Climate Change (NAPA)

Final Joint Report

February 2009

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Executive Summary

Up to 80 percent of Afghan people rely on the country's natural resource base for their livelihoods. Natural resource management is therefore of paramount importance to sustainable development and improved local livelihoods. However, in developing countries and particularly in post-conflict countries such as Afghanistan, natural resource management is greatly affected by limited human, institutional and physical capacities. In the light of this situation, the Global Environment Facility (GEF) supports the implementation of the National Capacity Needs Self-Assessment for Global Environmental Management (NCSA) and National Adaptation Programme of Action for Climate Change (NAPA) Projects. These projects, which have been combined into one process in Afghanistan, support the identification of priority capacity needs for the implementation of the Rio Conventions, namely, the United Nations Convention on Biological Diversity (UNCBD), United Nations Convention to Combat Desertification (UNCCD) and the United Nations Framework Convention on Climate Change (UNFCCC), and the identification of key activities that can mitigate the effects of climate change.

Afghanistan has implemented the NCSA and NAPA processes with support of the United Nations Environment Programme (UNEP) and with funds from the GEF. This final NCSA and NAPA Report is supplemented by three Thematic Reports that specifically address the areas of biodiversity, desertification and climate change. The objectives of the NCSA are to: (1) identify, confirm or review priority issues for action within the thematic areas of biodiversity, climate change and desertification, respectively; (2) explore related capacity needs within and across the three thematic areas; (3) catalyse targeted and coordinated action and requests for future external funding and assistance; and (4) link country action to the broader national environmental management and sustainable development framework. The objective of the NAPA is to serve as a simplified and direct channel of communication for information relating to the urgent and immediate adaptation needs of Afghanistan to the effects of climate change.

The environment in Afghanistan is characterized by a precarious balance between low levels of precipitation and primary production. The

disruption of traditional practices that has resulted from insecurity, migration, a breakdown of social structures, poverty and drought has led to over exploitation of the natural resource base. Today, we can observe a situation of biodiversity loss, land degradation for both natural and anthropogenic reasons, the denudation of bio-physical protection which accelerates wind and water erosion, and a real lack of productivity in the arid zones. Impoverished soils are reducing carrying capacity, resulting in overstocking, cultivation of unsuitable land for cash and subsistence crops, and exposure of soils to wind and water erosion. Conflicts are generated by competing land uses and decreased natural resource and water availability. The consequences have included severe flooding, soil and wind erosion, deforestation, reduced pasture quality, decimation of wildlife populations, air pollution, decrease in the quality and quantity of water for irrigation and drinking, and so on, all compounded by macro level climatic changes, especially those related to precipitation.

While there is awareness within the government of some of the consequences of biodiversity loss and desertification, particularly in the face of climate change, the pressure for survival at the local level and economic growth at the national level in an insecure country has resulted in little substantive action being taken to address the issue. In this context the NCSA and NAPA processes, together with the Rio Conventions themselves, provide Afghanistan with an opportunity to orient national development in a manner that fosters national ownership, promotion of partnerships, adaptation and capacity building for sustainable natural resource management.

Methodology

The NCSA and NAPA process was implemented in four phases: (1) inception phase; (2) thematic situation analysis and identification of priority activities for adapting to climate change; (3) identification of cross-cutting capacity needs for improving compliance with the Rio Conventions; and (4) development of the NCSA Action Plan. The process was operationalized by a steering committee responsible for overall guidance and four working groups. Members of the working groups were predominantly government staff, but also included members of the UN and national

non-governmental organizations. The working groups were technically supported by UNEP. The implementation of the NCSA and NAPA process was initiated by an inception workshop that launched the project. To summarize, the process realized was a country-driven consultative process of analysis and planning that determined national priorities and needs for capacity development to protect the global environment taking into account the Rio Conventions.

Constraints and opportunities for compliance with the Rio Conventions

The major constraints for the implementation of the Rio Conventions, as identified by the NCSA process, were cross-cutting for the three thematic areas (biodiversity, desertification and climate change) and therefore merited a synergistic intervention approach. They focused on: conflict and poverty; weak policy and legal frameworks for facilitating compliance with the Rio Conventions; weak inter-institutional coordination mechanisms; lack of strategies and plans for implementation of the Rio Conventions; low awareness of the Rio Conventions and associated issues; lack of data and information; inadequate technical capacities to comply with the Rio Conventions; unsustainable land and resource management practices; lack of infrastructure; inadequate funding; and limited research capacities.

Cross-cutting opportunities for improving compliance with the Rio Conventions include: existing supportive institutions; initial legislative framework; participatory approaches to natural resource management recognized; supportive international community; and potential for mainstreaming and tapping global resources.

NCSA Action Plan

The NCSA Action Plan was developed according to seven broad areas of intervention derived from the cross-cutting analysis of capacity building needs and opportunities identified during the thematic assessments:

Institutional strengthening for full participation in the Rio Conventions through strengthening strategic planning, establishing effective mechanisms for inter- and intra-institutional

coordination, and developing human resource capacities;

Legal, policy and implementing frameworks improved through the development of new legislation related to natural resource management; human and institutional capacity building for the implementation of the new frameworks; and awareness raising activities, both within the Government itself and also between the Government and the general public.

Education and public awareness improved through development of materials and realization of awareness raising activities.

Sustainable land and resource management through the implementation of new natural resource legislation in a participatory manner that involves systems of adaptive learning and facilitates the development of synergies and exchange of experiences as implementation progresses.

Research strengthened through the development of strategic incremental research plans that focus on specific priority issues together with training programmes in research design and implementation.

Technical and managerial capacity for the implementation of the Rio Conventions strengthened by reviewing school and University curricula to integrate Rio Convention issues; preparation of training materials; and training of key actors in technical and legal aspects of the Conventions, negotiation skills, conflict resolution and management, participatory methodologies, monitoring and evaluation, community based natural resource management (CBNRM), communications, research and data management, policy and law development and analysis, and related issues specific to each of the three Rio Conventions.

NAPA

Afghanistan has an arid and semi-arid continental climate with cold winters and hot summers. The climate varies substantially from one region to another due to dramatic changes in topography.

The wet season generally runs from winter through early spring, but the country on the whole is dry, falling within the Desert or Desert Steppe climate classification. The snow season averages October-April in the mountains and varies considerably with elevation.

Key climatic hazards in Afghanistan were identified by Working Group members to include periodic drought; floods due to untimely and heavy rainfall; flooding due to thawing of snow and ice; increasing temperatures; frost and cold spells; hail, thunder and lightning, and 120-day winds. The compilation of a sensitivity matrix indicated that droughts, floods due to untimely and heavy rainfall, and rising temperatures present the greatest hazards to ecosystem services, livelihood activities and means of livelihood in Afghanistan. Sectors identified as most vulnerable to climate change were those of water resources, forestry and rangeland, and agriculture.

The NAPA vision for Afghanistan is to increase awareness amongst all stakeholders of the effects of climate change and climate variability on their lives and to develop specific activities that build capacity to respond to current and future climate change threats. The objectives of the Afghanistan

NAPA are to: (1) identify priority projects and activities that can help communities adapt to the adverse effects of climate change; (2) seek synergies with existing multi-lateral environmental agreements (MEAs) and development activities with an emphasis on both mitigating and adapting to the adverse effects of climate change; and (3) integrate climate change considerations into the national planning processes.

The working group identified a total of 51 potential activity options for adapting to climate change. Through a series of evaluation exercises, two adaptation options were shortlisted and developed into summary project proposals: Improved Water Management and Use Efficiency and Land and Water Management at the Watershed Level.

Monitoring and evaluation

Monitoring and evaluation of the NAPA and NCSA will involve a wide range of stakeholders and will be conducted at multiple levels (local, regional and national). At the national and regional levels, the National Environmental Protection Agency (NEPA) will lead the monitoring and evaluation of the implementation of the NCSA action plan, in collaboration with other actors.

8 Framework for the National Adaptation Programme of Action

8.1 Introduction

This Chapter considers some of the key characteristics of Afghanistan's climate, together with major gaps in baseline climatic data. It continues to describe the results of a participative exercise with the CCDP-WG that focused on identifying the main climatic hazards that affect the country (also see Chapter 3). The major impacts of climatic hazards are investigated through the use of a sensitivity matrix that aims to provide a basic assessment of the effects of each of the climatic hazards on ecosystem services, livelihood means and livelihood activities.

8.2 Climate – current situation

Climate data and information on Afghanistan is scanty, sparse and not well documented. The first meteorological weather stations were installed by the Ministry of Transportation in 1953 in selected locations

around the country. These were subsequently rendered non-functional for many of the years of conflict and warfare. Today, the Meteorological Department of the Ministry of Transportation currently collects and monitors hydro-meteorological data, as do a number of other Ministries and projects, including MAIL. They rely on a network of weather stations located around Afghanistan, a large proportion of which are located on MAIL property. As of September 2007,⁴⁷ AgroMet has installed and is managing 89 sites, all of which record rainfall and snowfall (Figure 5). In addition to rainfall and snowfall, 78 out of 89 report on crop (wheat, maize, rice and barley), pasture and grazing conditions at least twice a month. 22 stations are complete agrometeorological stations, providing observations three times a day. 18 of these are classical stations, recording seven kinds of weather parameters. Four of these sites are automatic stations that can report up to 20 weather parameters daily. The general network of Afghanistan (see Figure 6) includes five complete automatic stations, five classic stations, 106 rain gauges, 15 French component classic stations, five ICARDA automatic stations, three ISAF automatic stations and three further classic stations.

Figure 5. Agromet network illustrating station types

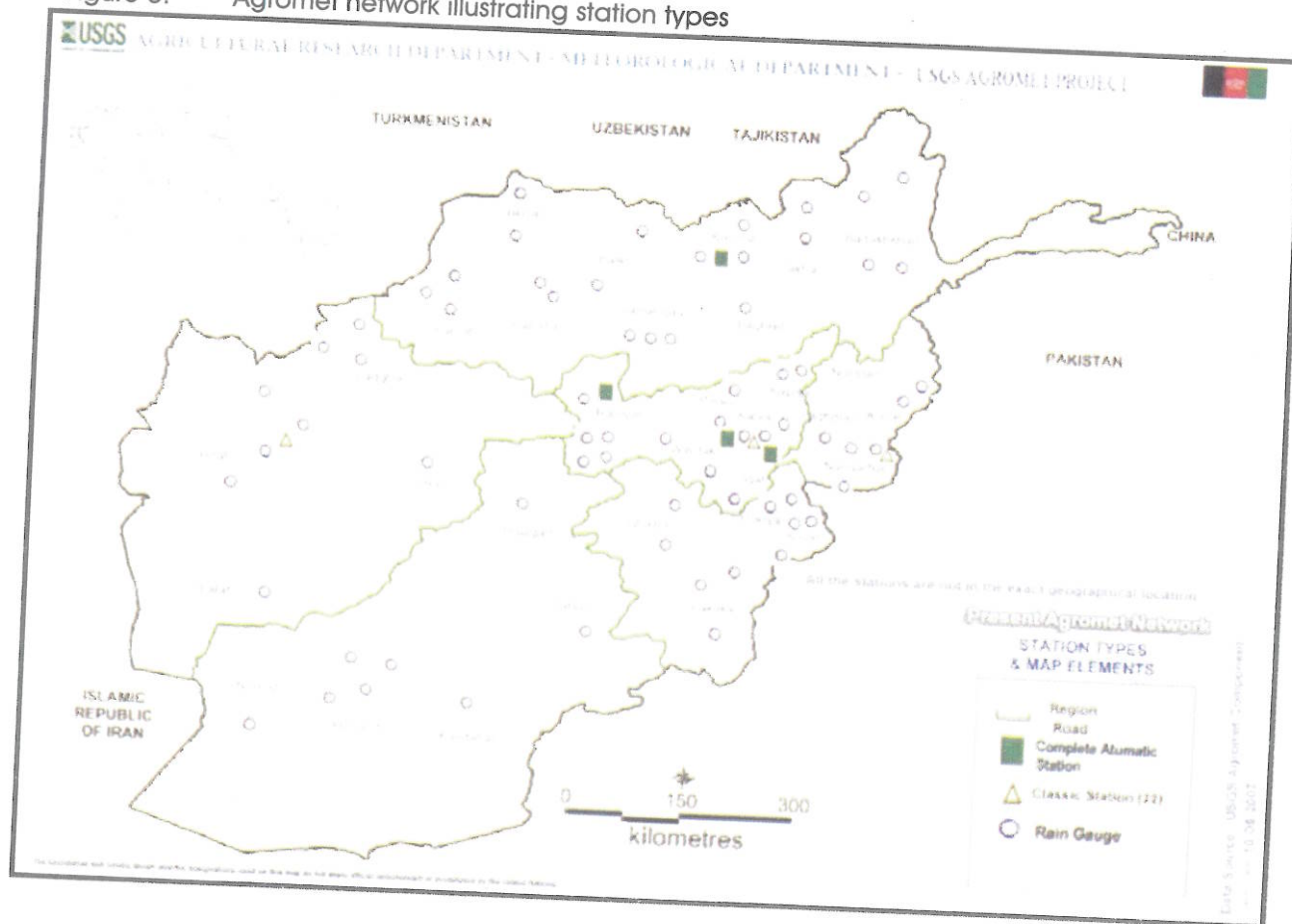
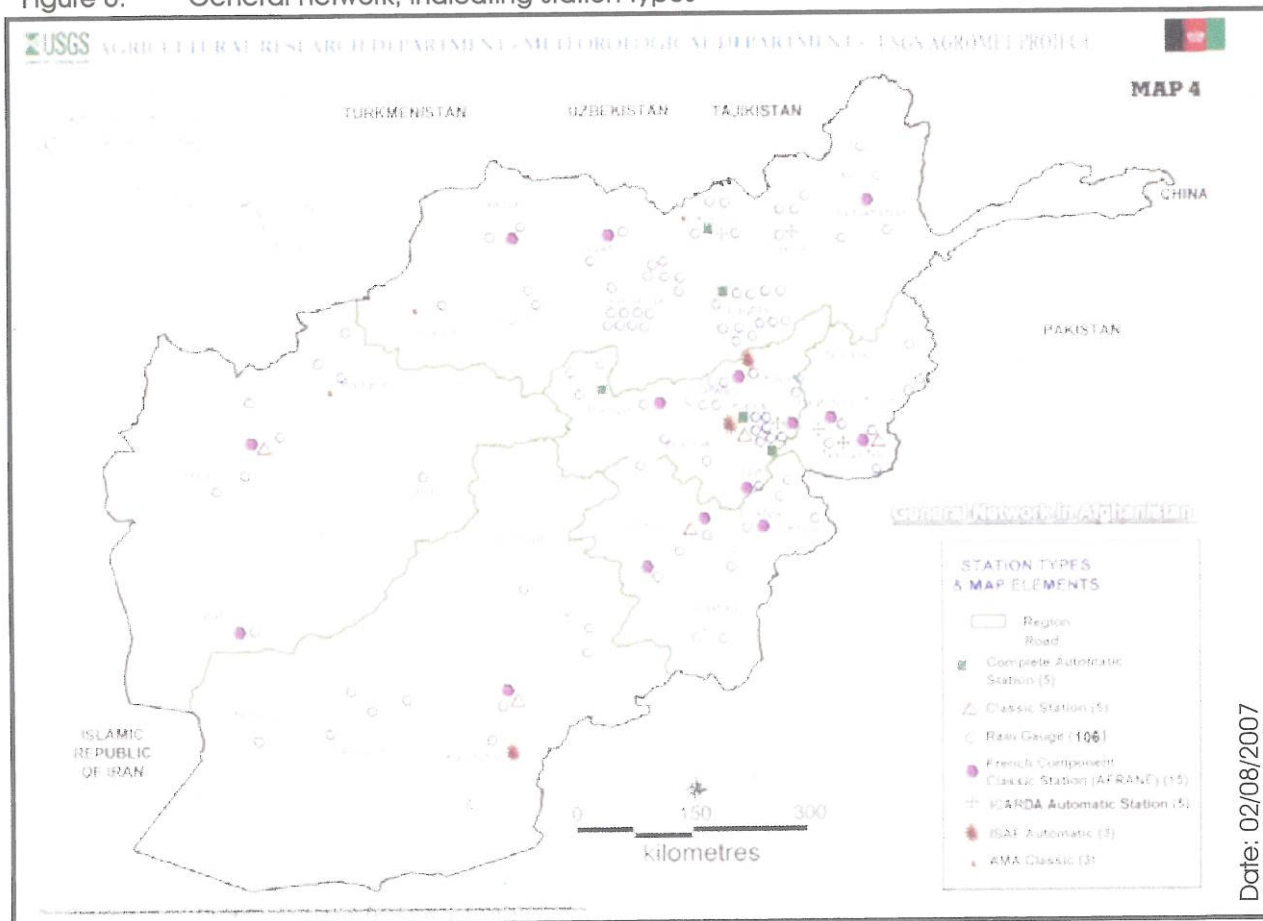


Figure 6. General network, indicating station types



Date: 02/08/2007

Afghanistan has an arid and semi-arid continental climate with cold winters and hot summers. The climate varies substantially from one region to another due to dramatic changes in topography. The wet season generally runs from winter through early spring, but the country on the whole is dry, falling within the Desert or Desert Steppe climate classification. The snow season averages October-April in the mountains and varies considerably with elevation with very little snow falling in the lowland deserts of the southwest.

On the intermountain plateaus the winds do not blow very strongly, but in the Sistan Basin severe blizzards occur during the winter, generally December through February. In the western and southern regions a northerly wind, known as the "wind of 120 days", blows during the summer months from June to September. This wind is usually accompanied by intense heat, drought and sand storms, bringing hardship to the inhabitants of the desert and steppe lands. Dust and whirlwinds frequently occur during the summer months on the flats in the southern part of

the country. Starting midday or early afternoon, these "dust winds" advance at velocities ranging between 97 and 177 kilometers per hour, raising high clouds of dust.⁴⁸

The period 1998 to 2005/6 in Afghanistan marked the longest and most severe drought in Afghanistan's known climatic history. According to the EU Emergency Humanitarian Aid Decision,⁴⁹ in general in Afghanistan, based on historical observation, regular cycles of around 15 years are observed, during which one would expect 2-3 years of drought conditions. In recent years, however, there has been a marked tendency for this drought cycle to occur more frequently than the model predicts, and since 1960, the country has experienced drought in 1963-64, 1966-67, 1970-72 and 1998-2006. The failure of rain-fed crops (estimated to constitute up to 80 percent of the cultivated land) was a widespread phenomenon and the livelihoods of millions of rural people, mainly in the north, west and central regions of Afghanistan, were severely marginalized.

Climate normals were computed by Afghanistan ten years ago and provided to the World Meteorological Organization (WMO) for the global standard normals project. The Afghan normals cover the period from 1956-1983 (approximately). Based on the seven stations for which climate normals were provided:⁵⁰

The average annual precipitation ranges from 5.2 centimeters (2.03 inches) at Zaranj in southwest Afghanistan to 99.2 centimeters (39.06 inches) in the northeast mountains at North Salang.

Temperatures can vary widely, from as cold as -46°C (51 degrees below zero F) at Chakhcharan (in the north central mountains at an elevation of 2183 m (7162 feet)) to as hot as 51°C (124 degrees F) in the southwestern deserts at Zaranj.

The mountain valleys can experience, on average, 10 to 30 days per year with snowfall, but the higher passes receive much more snow.

At an elevation of 3366m (11043 feet), North Salang receives snow, on average, 98 days

out of the year with depths reaching as high as 4.5 m (177 inches). Snow has been observed on the ground there as early as August and as late as June.

Table 6 shows the Global Standard Normal (WMO) mean monthly temperature (°C) for each station. It shows clearly that elevation and season strongly influence mean monthly temperature ranging from -11°C (12.2F) at Salang (3366m resp. 11043 feet) in January to + 34 °C (93.2 F) at Farah (700 m resp. 2296 feet) in July.

Table 7 shows WMO Global Standard Normals for mean monthly precipitation (mm) at seven stations. Like temperature, precipitation is strongly influenced by elevation, with the highest mean monthly precipitation of 996 mm (39.2 inches) measured at Salang (3366 m resp. 11043 feet) and the lowest of 97 mm (3.8 inches) at Farah (700 m resp. 2296 feet) .

These trends are further illustrated in the following maps (Figure 7), which indicate maximum temperature and maximum precipitation during the driest and wettest seasons.

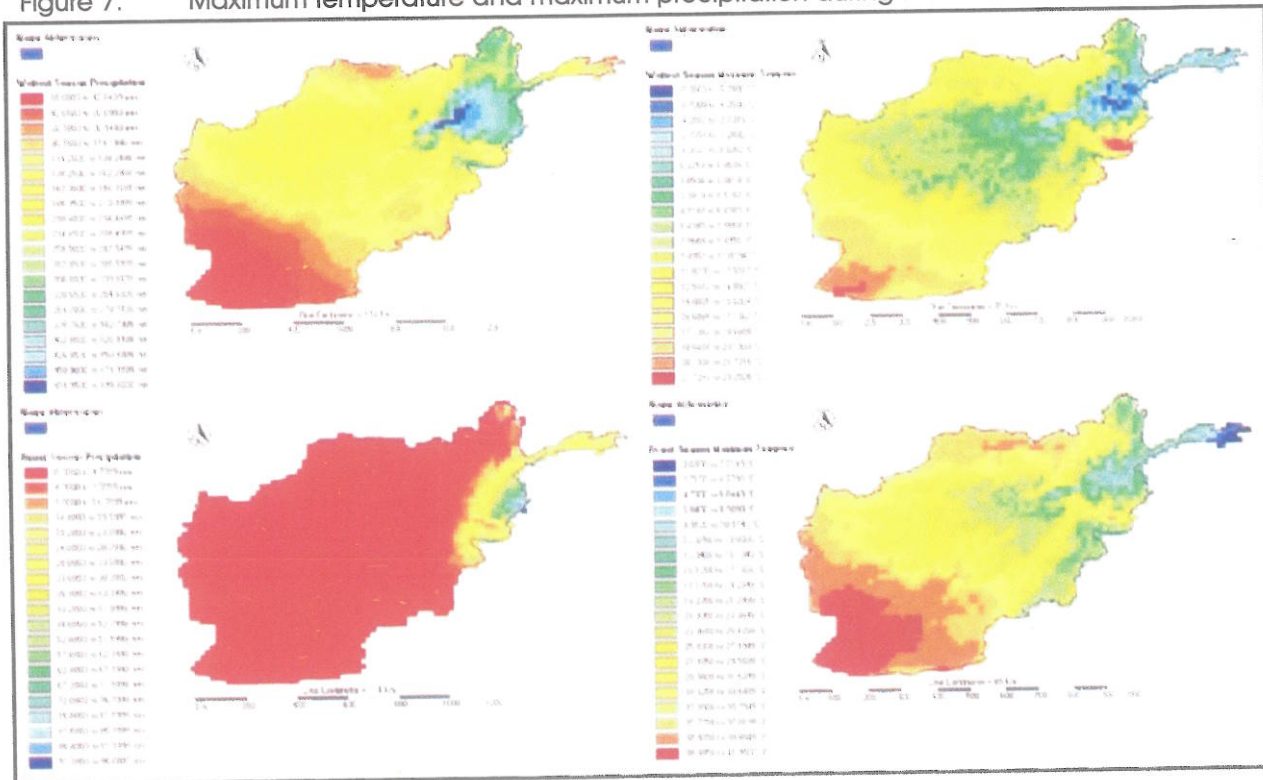
Table 6. World Meteorological Office Global Standard Normal Mean Monthly Temperature (C) from seven Afghan Stations, 1956-1983

	Elevation / m	J	F	M	A	M	J	J	A	S	O	N	D	Mean
Herat	964	3	6	10	16	22	30	30	28	23	16	9	4	16
Farah	700	7	10	16	22	27	32	34	32	27	20	13	9	21
Chagcharan	2183	-9	-7	2	9	13	17	19	18	12	7	2	-4	6
Kandahar	1010	5	8	14	20	26	30	32	29	23	18	11	7	19
Kabul	1791	-2	2	6	13	17	23	25	24	19	13	6	1	12
Salang	3366	-11	-9	-6	0	3	8	9	8	4	1	-4	-8	0
Faizabad	1200	0	2	8	14	18	24	27	26	21	8	8	3	13

Table 7. World Meteorological Office Global Standard Normal Mean Monthly Precipitation (mm) from seven Afghan Stations, 1956-1983

	Elevation / m	J	F	M	A	M	J	J	A	S	O	N	D	SUM
Herat	964	51	46	56	28	10	0	0	0	0	3	10	36	239
Farah	700	25	23	23	8	3	0	0	0	0	3	3	10	97
Chagcharan	2183	30	33	41	36	20	0	0	0	0	10	15	18	203
Kandahar	1010	53	43	41	18	3	0	3	0	0	3	8	20	191
Kabul	1791	36	61	69	71	23	0	5	3	3	3	18	23	312
Salang	3366	109	142	185	198	124	10	8	8	8	30	69	104	996
Faizabad	1200	48	66	91	99	76	8	5	0	3	23	30	33	483

Figure 7. Maximum temperature and maximum precipitation during the driest and wettest seasons



8.3 Climate trends and gaps in baseline data

Given the general lack and inaccessibility of data, scarce resources, lack of capacity and trained man-power, projecting climate change in a meaningful and systematic manner is an extremely difficult task in Afghanistan. Historic climatic data has recently been accessed by the PEACE project, albeit with a long gap that accompanies the period of war and conflict in Afghanistan. Researchers working on the PEACE project are currently correcting errors in the data, following which modeling will be realized. This information will contribute significantly to climate knowledge in Afghanistan and will facilitate analysis of climatic trends and potential impacts for the Afghan people and environment.

Gaps in baseline data relating to the climate and climate change in Afghanistan are significant. It is anticipated that some of these gaps will be covered by climatic data that is being compiled and analyzed by the PEACE project. Currently, basic climatic data is being collected although only four out of the fifteen fully automated stations are providing reliable data. To this end, it is necessary to improve the reliability of the fourteen

additional stations and expand data analysis capacities. Continued conflict throughout the south and south-east of the country furthermore potentially threatens the continuity of data collection in these regions.

8.4 Key climatic hazards

Key climatic hazards in Afghanistan were identified by CCDP-WG members in a participatory discussion that involved the development of an inventory of common hazards. Each hazard was then critically assessed using criteria and scoring system presented in NAPA documentation (encompassing a subjective assessment of impacts, loss of life, duration, spatial extent, frequency and tendency, see Annex 8),⁵¹ following which detailed discussions facilitated the elaboration of a description of each hazard and a basic assessment of the climatic hazard on the following factors: loss of life and livelihoods; human health; food security and agriculture; environment; water availability, quality and accessibility; and general trends. Furthermore, a five-page briefing note on each of the different climatic hazards was prepared by the WG members. The WG's expert opinions of the effects of each of the hazards are summarized in Table 8.



Collection of fuel wood from already degraded area in Kang District, Nimroz

The sensitivity of ecosystem services, livelihood activities and means of livelihood, to each of the climatic hazards was then assessed by the CCDP-WG. Following the calculation of a preliminary exposure index, a weighting was applied that considered both the physical area affected by the climatic hazard and the importance of the effect. The results of this exercise are illustrated in the following sensitivity matrix (Table 9).

The sensitivity matrix indicates that, generally, droughts, floods due to untimely and heavy rainfall and rising temperatures present the greatest hazards to ecosystem services, livelihood activities and means of livelihood in Afghanistan. In terms of ecosystem services, soil water content, water from irrigation, firewood and grazing are most affected by the climatic hazards. Effects on food crops, market crops and livestock components of livelihood activities are similarly high – to be expected given the importance of these activities to the livelihood portfolio in rural areas of Afghanistan. In terms of livelihood means, irrigated agriculture, livestock herders and dryland farmers are considered the most susceptible to the impacts of the various climatic hazards. Perhaps surprisingly, Kuchi pastoralists were considered

to be less negatively affected and this can be attributed to the fact that their mobile lifestyle has traditionally facilitated their adaptation to, and avoidance of, the climatic hazards.⁵²



Climate Change and Disaster Preparedness Working Group Meeting, October 2007, Kabul

Table 8. Narrative description of climatic hazards and some of their impacts

Climatic Hazards	Description	Loss of life and livelihoods	Human Health	Duration	Food security and Agriculture	Environmental effects (Biological diversity, forestry)	Water availability, quality and accessibility	Trends
Periodic drought	Decrease in productivity of crops; forced migration; changes in livelihood; decrease in amount of exports; and financial losses.	Group of livestock herders including Kuchi, irrigated agriculturalists and dryland farmers are affected; and around 10,000 casualties per year of severe drought.	Malnutrition, spread of diseases such as malaria, sishnaia, cholera, typhoid, tenasagenata, asccaris and diarrhea.	Up to 8 years	Drought has generated an estimated loss production of: 75% wheat, 85% rice, 85% maize, 50% potatoe and 60% of overall farm production, between 1998 and 2005.	Pistachio, pine nut, wild almond and conifer forest production negatively affected. Waterfowl sanctuaries such as Dasht-i-Nawar, Ab-i-Estada and Kol-i-Hashmat Khan have dried up. Wildlife being displaced.	Decreased availability of under ground water, springs and karezes dry-up, fow of major rivers collapses, degradation of watersheds and drop in level of water reservoirs and dams.	Increasing frequency and intensity.
Floods due to untimely and heavy rainfall	Collapse and sedimentation of irrigation canals; destruction of agricultural lands; loss of crops and livestock; collapse of dwellings; spread of epidemic diseases; destruction of infrastructure such as roads and bridges; and damage to the national economy.	Approximately 750 casualties per year.	Increased incidence of cholera, typhoid, diarrhea and malaria.	3 months	Loss of 10% of agricultural production and gardens that are located alongside rivers and in high risk areas.	Soil degradation; loss of natural forest (riverine forest being particularly affected); increased levels of water siltation and sedimentation; and displacement of wildlife.	Infrastructure damage around US\$ 300 million as a result of a severe food.	Increasing frequency and intensity.
Flooding due to thawing of snow and ice	River levels rise; destruction of riverside agricultural and non-agricultural (forest, range, etc.) lands; land slides; soil erosion; destruction of infrastructure such as bridges and gabions.	Around 100 casualties per year.	Increased incidence of cholera, typhoid, diarrhea and malaria.	4 months	2% damage of agricultural land alongside rivers.	Soil degradation; loss of natural forest (riverine forest being particularly affected); increased levels of water siltation and sedimentation; and displacement of wildlife.	Destruction of river banks,, associated agricultural land and infrastructure at a value of around US\$ 400 million as a result of a severe food.	Increasing frequency
Rise in temprature	Increase in levels of incidence of diseases that affect humans, agriculture and livestock; habitat changes affect wildlife; changes in vegetation cover and associated grazing patterns.	Around 1,000 casualties per year	Increased incidence of malaria, leshmania, typhoid and diarrhea.	3 months	Decreased agricultural, livestock and horticultural production.	Less productivity of natural system, displacement and changing of wildlife habitat.	Increasing evapotranspiration rates; reduction in water level.	Increasing frequency and intensity.
Frost and cold spells	Degradation of fruits, crops, vegetable and health disease, poor economy and increasing of poverty.	Loss of fruits and potatoes; approximately 300 indirect casualties per year.	Illnesses associated with cold weather.	3 days, two times per year	20% of gardeners in the country are affected, particularly those with horticultural crops.	Affects forest rehabilitation and afforestation programs (particularly nurseries and saplings).	Low impact.	Increasing frequency and intensity.
Hail, thunder and lightening	Destruction of crops (particularly horticultural crops); human and livestock losses; and outflow/gush from foods.	Approximately 150 casualties per year.	Illnesses associated with cold weather.	Around 20 days	Up to 20% loss in horticultural and crop production.	Low impact.	Low impact.	Increasing frequency and intensity.
Monsoon and 120-day winds	Desertification; degradation of agricultural lands and crops; destruction of infrastructure; air pollution; spread and transmission of diseases and respiratory problems; sedimentation of irrigation systems and springs; local and national economy negatively affected.	Around 10 casualties per year.	Eyes, respiratory and skin diseases.	120 days	Decrease in horticultural and crop production, degradation of rangeland and reduced livestock production.	Desertification; decreased plant cover.	Losses (temporary and more permanent) of infrastructure, siltation of water sources, decreased quality of water.	Increasing frequency and intensity.

Table 9. Sensitivity matrix for resources and groups to climate change

	Climatic Hazards							Preliminary exposure index	Weighting - area affected / importance	Final score	
	Periodic drought	Floods due to untimely and heavy rainfall	Flooding due to thawing of snow and ice	Rise in temperature	Frost and cold spells	Hail, thunder and lightening	Monsoon and 120-day winds				
Ecosystem Services											
Soil water content	5	2	4	4	1	2	3	60	1	60	
Water from irrigation	5	3	1	3	1	1	2	46	0.8	37	
Fuelwood	4	3	1	2	1	2	3	46	0.8	37	
Grazing	5	3	2	4	1	2	3	57	0.7	40	
Fodder	4	3	2	3	1	3	3	54		0	
Wild fruit production	4	1	1	3	3	2	2	46		0	
Wildlife	4	3	2	4	1	2	2	51		0	
Medicinal plants	4	3	2	3	1	3	2	51	0.4	21	
Pollination	4	3	1	1	4	4	3	57	0.2	11	
Livelihood Activities											
Food crops	4	4	4	3	3	4	3	71	1	71	
Market Crops	5	4	3	3	5	4	3	77	0.5	39	
Livestock	5	3	2	4	2	1	2	54	0.9	49	
Wood	4	3	1	2	1	2	3	46	0.8	37	
Daily wage labours	5	2	1	3	1	1	2	43	0.8	34	
Useful Insects	5	2	1	4	4	3	4	66	0.2	13	
Trade	4	4	3	3	3	3	2	63	0.5	31	
Means of livelihood											
Dryland farmers	5	4	3	4	1	3	4	69	0.7	48	
Irrigated agriculture farmers	5	4	4	3	4	4	3	77	1	77	
Livestock herders	5	3	3	4	2	2	2	60	0.9	54	
Pastoralists (Kuchi)	5	4	3	4	1	3	3	66	0.5	33	
Poppy growers	2	3	3	1	3	4	2	51	0.8	41	
Impact index	89	61	45	62	42	52	53				
Weighting - area affected	1.0	0.8	0.6	0.8	0.7	0.4	0.4				
Final score	89	49	27	50	29	21	21				
High priority								Weighting scale ranging from 1 (low impact) to 5 (high impact)			

8.5 NAPA Vision

The NAPA vision for Afghanistan is to increase awareness amongst all stakeholders of the effects of climate change and climate variability on their lives and to develop specific activities that build capacity to respond to current and future climate change threats.

8.6 Objectives of NAPA

The objectives of the Afghanistan NAPA are to:

- Identify priority projects and activities that can help communities adapt to the adverse effects of climate change;

Seek synergies with existing MEAs and development activities with an emphasis on both mitigating and adapting to the adverse effects of climate change; and

Integrate climate change considerations into the national planning processes.

8.7 Strategies of NAPA

Through closely adhering to the guidelines for the preparation of the NAPA,⁵³ the Afghanistan process has been guided by the following principles:

- Multidisciplinary: The CCDP-WG represented various sectors of the government, and the



NAPA and NCSA Regional Workshop in Herat September 2007, with farmers and livestock herders from Herat, Badghis and Farah

four regional workshops included the presence of farmers from settled agriculture, livestock, rainfed agriculture, and pastoralist livelihoods. This ensured the expression and consideration of multiple perspectives in the analysis realized.

Participatory approach: Regional consultations were undertaken in four locations and persons from eleven provinces participated. This allowed for the inclusion of stakeholder views and also increased Afghan ownership of the process.

Synergy generating: National development strategies formed the framework for the NAPA process and synergies with other multilateral environmental conventions was one of the indicators used when prioritizing project profiles. The recommendations presented here therefore aim to be highly complementary and synergy generating.

Sustainable development: Poverty reduction to enhance adaptive capacity formed one of the four criteria used to prioritize and select project profiles.

Gender component: Although the Ministry of Women's Affairs was invited to participate in the CCDP-WG, they declined to participate. Furthermore, given the cultural constraints associated with involving women in public events with a high male presence, they did not participate in the regional workshops. NCSA questionnaires were distributed to and completed by the Ministry/ Department of

Women's Affairs at national and provincial levels for completion and return to UNEP.

Country driven approach: The information generated by the CCDP-WG and in the Regional Workshops has formed the basis for this present report.

Cost effectiveness: Cost effectiveness was one of the indicators used when prioritizing project profiles.

Simplicity: The NAPA process aims to have a simple and clear approach to addressing adaptation to climate change.

8.8 Summary

Information about climate and climate change in Afghanistan is currently limited. International organizations are currently working together with the Afghan Government to review and revise existing, currently un-digitalized, historic climatic data in an important process that will contribute significantly to knowledge on climate change.

Participatory exercises with the CCDP-WG facilitated the collection and discussion of expert opinion on major climatic hazards and their effects on the country. This process resulted in the conclusion that periodic drought, floods due to untimely and heavy rainfall, and rising temperatures present the greatest hazards to ecosystem services, livelihood activities and means of livelihood in Afghanistan. The general opinion of the CCDP-WG was that both the severity and frequency of such events are increasing.

9 Identification of Key Adaptation Needs

9.1 Introduction

Chapter 9 will identify the sectors and groups that are most vulnerable to climate change and that require adaptation. Potential adaptation options identified by the CCDP-WG are then detailed, followed by a description of the process used to short-list the two most important of these. The Chapter concludes by identifying potential barriers to implementation of the adaptation options.

9.2 Sectors and groups in need of adaptation

Adaptation is a process by which individuals, communities and countries seek to cope with the consequences of climate change. It refers to all of the responses to climatic conditions that may be used to reduce vulnerability. The principle forms of adaptation initiatives to climate change are guided by:

National priorities: guided by the needs of the country and the vulnerable groups, resources and regions at risk, with the support of national infrastructure and institutional capacities that are required for the increase and maintenance adaptive capacities;

Urgent priorities: related to the sustainable management of resources in relation to current climate risks or climatic constraints (i.e. thresholds);

Strategic priorities: dependent on increasing resilience and adaptive capacities of populations in order to better cope with climate related hazards; and

Development priorities: integration of climate response strategies into development policies and poverty alleviation.

In order to assess the vulnerability of seven major sectors to climate change, a matrix was developed with the following specifications:

Sectors vulnerable to climate change;

Socio-economic index of each sub-sectors which the socio-economic index is calculated based on the following formulae: Socio-economic index = $0.3 * \text{Socio index} + 0.7 * \text{Economic index}$;⁵⁴

The impact of major climatic and climate induced parameters were assessed through the expert judgment and Thomas Saaty weighting method; and

The vulnerability index for each sector was calculated as the sum product of socio-economic index and sub-sectors vulnerability rank on climatic parameters.

The summarized results of vulnerability assessment for Afghanistan are shown in Figure 8 and Figure 9 (detail presented in Annex 9). Figure 8 indicates that the water resources, forestry and rangeland, and agriculture sectors, with -338, -323 and -283, respectively. Comparatively, climate change was assessed as having low adverse impacts on the energy and waste sectors. Figure 9 disaggregates 'climate change' into four factors - increased temperature, evapo-transpiration and salinity, precipitation channel change, and drought – and analyzes their impact on the seven sectors.

In view of the discussions realized in the CCDP-WG, briefing notes summarizing livelihood characteristics, information on climate-related hazards, and expert opinion on climate change and variability, we can conclude that:

Figure 8. Vulnerability rank of sectors to climate change

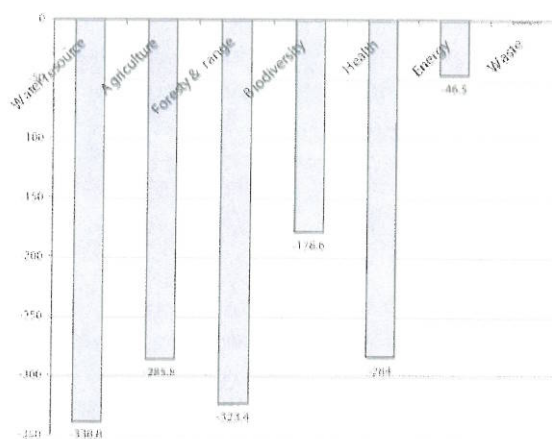
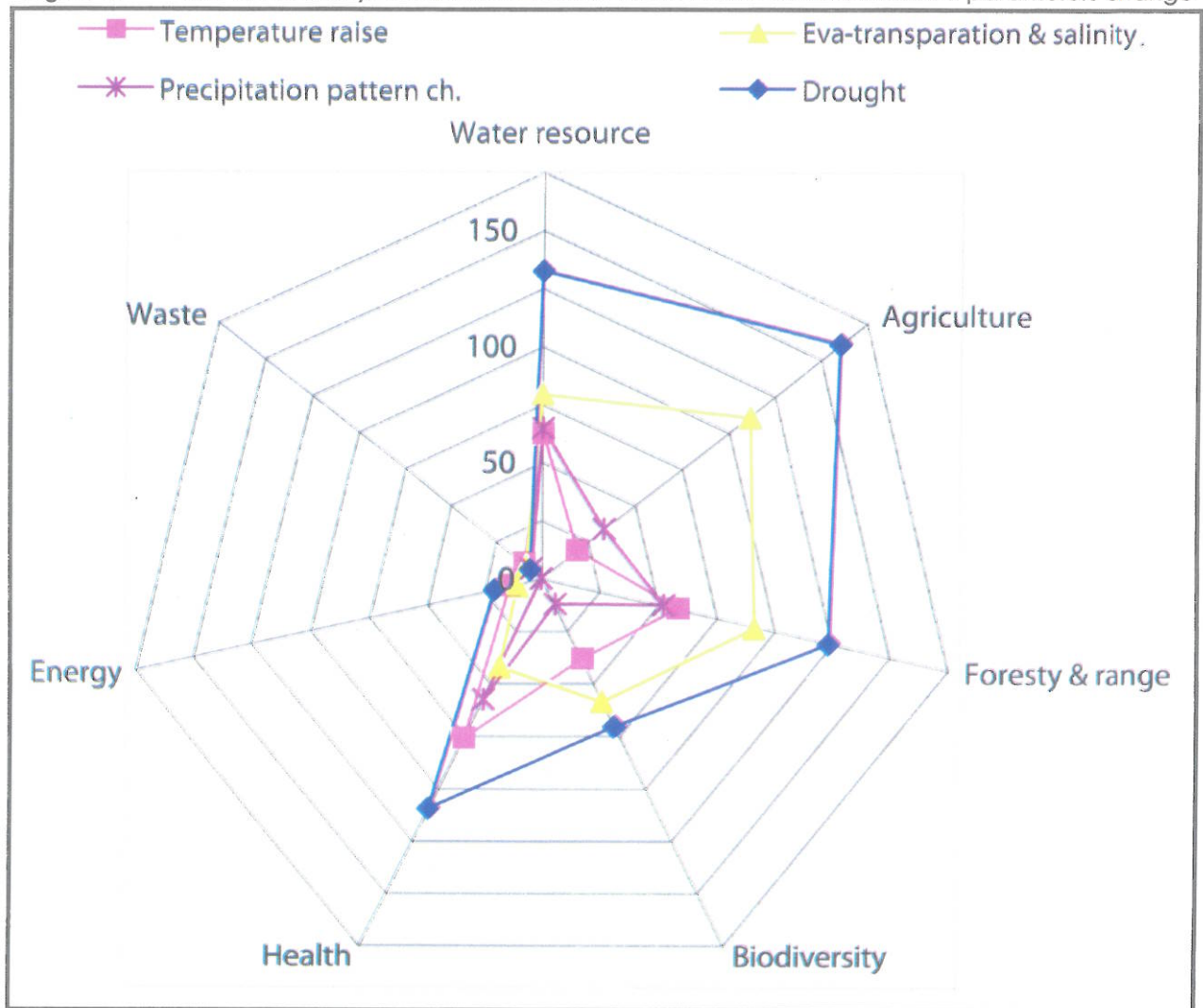


Figure 9. The vulnerability of different sectors to climatic and climate induced parameters change



The most likely adverse impacts of climate change in Afghanistan are drought-related, including associated dynamics of desertification and land degradation. Floods due to untimely rainfall and a general increase in temperature are of secondary importance, but are both exacerbated by and exacerbate the adverse impacts of drought.

The most vulnerable sectors are Water Resources, Forestry and Rangeland, and Agriculture, as primary production is limited by rainfall and the long, hot summers. Since an estimated 75 percent of the Afghan population lives in rural areas,⁵⁵ crop failure, reduced yields and stress on livestock will affect the most vulnerable households in the community and therefore the poorest sectors of the Afghan population.

It follows that the most vulnerable communities are the rural poor who depend directly on crops,

livestock and water resources, particularly those with a little diversified income portfolio and weak social safety nets.

Although it is possible to make some general observations concerning the impacts of climate change within the household, the most vulnerable members and the degree of the impact varies according to ethnic group. Generally speaking, however, women are extremely vulnerable given their general immobility and dependence upon the male members of the household (this being an issue that extends well beyond climate change). It has been noted that, during periods of drought, young women and children may be sold into marriage so that their families can afford to eat. Children are also highly vulnerable to climate change, given that they are widely responsible for realizing small scale livestock herding and collection of firewood.

9.3 Potential adaptation options

A total of 51 potential adaptation options were identified by the CCDP-WG. These were categorized according to seven broad themes: human health; water resources and renewable energy; agriculture and food security; animal husbandry, grazing and rangelands; forests and biodiversity; natural disaster preparedness and infrastructure; and capacity building. They are listed fully in Annex 9.

9.4 Evaluation criteria

The CCDP-WG agreed to apply an adapted Multi-Criteria Analysis (MCA) technique to the full list of potential adaptation options in order to reach consensus on the selection of the top priority NAPA projects. Firstly, four general criteria were used to screen and select priority adaptation activities:

- Level or degree of adverse effects of climate change;
- Poverty reduction to enhance adaptive capacity;
- Synergy with other multilateral environmental agreements; and
- Cost effectiveness.

For each of the potential adaptation activities proposed, the group rated it against each of these four criteria. Using a consensus based approach

they were able to eliminate project ideas that failed to meet one or more of the above criteria. The four general criteria were therefore used to narrow down the total list of proposed activities from an initial list of 51 adaptation activities from seven sectors (as presented in Annex 10) to a list of 11 general activities, as shown in Table 10. These project concepts primarily related to the two climatic hazards of drought and flooding.

In the second step of the selection process, the CCDP-WG employed a second set of criteria (based upon those suggested in NAPA guidelines), listed in continuation:

- 1) Loss of life;
- 2) Human health;
- 3) Food security
- 4) Agriculture;
- 5) Water availability, quality and accessibility;
- 6) Impact on vulnerable groups;
- 7) Essential infrastructure;
- 8) Cost of the project;
- 9) Biological diversity; and
- 10) Land use management and forestry

These criteria were weighted, as indicated in Table 11.



Evaluating and presenting potential adaptation options, July 2007, Kabul

Table 10. Eleven project concepts and titles, as identified in the first ranking exercise

Outline of project concept	Summary Title
Improved water management and use efficiency through the introduction of drip and sprinkler irrigation, improved physical structures and increased public awareness.	Improved Water Management and Use Efficiency
Research into drought resistant seeds, different varieties of plants and livestock and plant protection; including establishment of agricultural farms.	Agricultural Research
Improved livestock production through the creation of livestock unions, cooperatives and associations; introduction of improved species and veterinary services.	Improved Livestock Production
Development of horticulture through use of improved varieties, establishment of nurseries and plant protection.	Development of Horticulture
Improving food security measures through diversification; promotion of household level industries, including chicken farms, beekeeping and silk farms; and development of market potential for agricultural products.	Improved Food Security
Rangeland management, including development and implementation of systems of rotational grazing and production of improved fodder along grazing routes (mixed grasses, legume).	Rangeland Management
Create more off-farm or cash earning job opportunities for farmers who are affected by crop loss due to climate change effects.	Creation of Off-farm Employment
Installation of agro-meteorological stations, early warning system, hazard mapping; survey, assessment and projection of the impact of deep wells on the water table and future water supplies. Build capacity and expertise for assessment of climate change adaptations, including technical capacity to monitor and analyze climatic trends, plan and implement adaptation activities, improve forecasts and inform policy makers.	Climate-Related Research and Early Warning Systems
Disaster management strategy – planning for food security and emergency supplies to vulnerable communities.	Development of Disaster Management Strategy
Land and water management at the watershed level. Community based forest management and afforestation projects in ways that conserve land, water resources and wood production; realize afforestation of catchment areas and stabilization of unstable slopes; soil conservation techniques.	Land and Water Management at the Watershed Level
Terracing, agroforestry and agro-silvo pastoral systems that reduce soil erosion and run-off on steep slopes; conserve land, water resources and wood production; soil conservation techniques.	Improved Terracing, Agroforestry and Agro-silvo Pastoral Systems

Table 11. Weighting given to the second set of criteria to be used in screening potential adaptation activities

Proposed criteria	Weighting by WG	Equal weighting
Loss of life	0.14	0.1
Human health	0.13	0.1
Food security	0.12	0.1
Agriculture	0.12	0.1
Water availability, quality and accessibility; water use efficiency	0.13	0.1
Impact on vulnerable groups	0.12	0.1
Essential infrastructure	0.03	0.1
Cost effectiveness of the project	0.07	0.1
Biological diversity	0.06	0.1
Land use management and forestry	0.08	0.1
Total	1	1

9.5 Shortlist and selection of proposed adaptation activities

The two short-listing processes resulted in the selection of two priority projects for which basic project outlines were elaborated. The results of this process are illustrated in Table 12. As can be noted from the scores presented, the weighting of the criteria did not affect the overall outcome of the exercise. In both instances, the projects Improved Water Management and Use Efficiency and Land and Water Management at the Watershed Level were identified as priority for facilitating adaptation to climate change. They were closely followed by Development of Horticulture and Improved Terracing, Agroforestry, and Agro-silvo Pastoral Systems.

9.6 Relation of NAPA to Afghanistan's Development Goals

The adaptation responses identified in the NAPA framework for Afghanistan are closely linked to the interim-ANDS (i-ANDS) strategy and Ministry policies, programs and activities. The ANDS



Discussion of potential adaptation options by representatives of farmers and livestock herders from Parwan province, Workshop organized in Kabul in October 2007

is divided into three pillars – (1) security, (2) governance, rule of law, and human rights, and (3) economic and social development. With more than 43 benchmarks across these pillars, the ANDS organizes priority national reforms into eight sectors and five cross-cutting areas. More detail is provided on the linkage between these and the environment in Chapter 4.2, section on the Afghanistan National Development Strategy.

The ANDS has a “pro-poor” approach that aspires to reflect the multidimensional nature of poverty, and to develop policies that benefit the poor by reducing inequalities and encouraging growth with pro-poor income distribution. The strategy identifies several cross-cutting issues relevant for NAPA, including empowerment of vulnerable sectors of society by provision of roads, health care, education, electricity and systems of governance that increase decision making powers at community / village levels. The ANDS will form the country’s first Poverty Reduction Strategy Paper (PRSP), an instrument required for World Bank and International Monetary Fund Highly Indebted Poor Country assistance and relief.

9.7 Potential barriers to implementation

Afghanistan, facing major developmental challenges and being ranked 174 out of the 178 countries on the

2007 Human Development Index, has very limited internal capacity to fund and implement adaptation activities. In summary, the major barriers to NAPA activities are:

- Lack of capacity in terms of human resources;

- Low levels of awareness of the current and potential impacts of climate change;

- Limited access to arid and semi-arid zones in the south and the south-west due to a combination of physical isolation and ongoing conflict;

- Difficulty to adequately address (and institutionalize) environmental issues in the face of other pressing development challenges;

- Limited analytical capability, especially for analyzing climatic data to assess threats and potential impacts, and develop viable solutions; and

- Limited resources, as funds of donor partners are currently overstretched addressing other priority issues that include security, health, education, gender, conflict resolution and agricultural development, amongst others.

Table 12. Detailed ranking of short-listed projects

Summary Title	Loss of life			Human health			Food security			Agriculture			Water availability, quality and accessibility; water use efficiency		
	No weighting	With standard weighting of 0.1	With weighting of 0.14	No weighting	With standard weighting of 0.1	With weighting of 0.13	No weighting	With standard weighting of 0.1	With weighting of 0.12	No weighting	With standard weighting of 0.1	With weighting of 0.12	No weighting	With standard weighting of 0.1	With weighting of 0.13
Improved Water Management and Use Efficiency	5	0.5	0.7	5	0.5	0.65	5	0.5	0.6	5	0.5	0.6	5	0.5	0.65
Agricultural Research	1	0.1	0.14	3	0.3	0.39	5	0.5	0.6	5	0.5	0.6	5	0.5	0.65
Improved Livestock Production	1	0.1	0.14	3	0.3	0.39	3	0.3	0.36	1	0.1	0.12	1	0.1	0.13
Development of Horticulture	1	0.1	0.14	3	0.3	0.39	5	0.5	0.6	5	0.5	0.6	3	0.3	0.39
Improved Food Security	1	0.1	0.14	5	0.5	0.65	5	0.5	0.6	1	0.1	0.12	1	0.1	0.13
Rangeland Management	1	0.1	0.14	3	0.3	0.39	3	0.3	0.36	3	0.3	0.36	3	0.3	0.39
Creation of Off-farm Employment	1	0.1	0.14	1	0.1	0.13	3	0.3	0.36	3	0.3	0.36	1	0.1	0.13
Climate-Related Research and Early Warning Systems	1	0.1	0.14	1	0.1	0.13	3	0.3	0.36	3	0.3	0.36	1	0.1	0.13
Development of Disaster Management Strategy	3	0.3	0.42	5	0.5	0.65	3	0.3	0.36	3	0.3	0.36	1	0.1	0.13
Land and Water Management at the Watershed Level	1	0.1	0.14	3	0.3	0.39	3	0.3	0.36	5	0.5	0.6	5	0.5	0.65
Improved Terracing, Agroforestry and Agro-silvo Pastoral Systems	1	0.1	0.14	1	0.1	0.13	3	0.3	0.36	5	0.5	0.6	5	0.5	0.65

Table 12 (cont.). Detailed ranking of short-listed projects

Impact on vulnerable groups			Essential infrastructure			Cost effectiveness of the project			Biological diversity			Land use management and forestry				
No weighting	With standard weighting of 0.1	With weighting of 0.12	No weighting	With standard weighting of 0.1	With weighting of 0.03	No weighting	With standard weighting of 0.1	With weighting of 0.07	No weighting	With standard weighting of 0.1	With weighting of 0.06	No weighting	With standard weighting of 0.1	With weighting of 0.08	Totals with equal weighting	Ranking
															Totals with weighting applied	Ranking
5	0.5	0.6	3	0.3	0.09	5	0.5	0.35	5	0.5	0.3	5	0.5	0.4	4.8	1
3	0.3	0.36	3	0.3	0.09	3	0.3	0.21	3	0.3	0.18	3	0.3	0.24	3.4	5
3	0.3	0.36	3	0.3	0.09	1	0.1	0.07	1	0.1	0.06	3	0.3	0.24	2	9
5	0.5	0.6	5	0.5	0.15	5	0.5	0.35	3	0.3	0.18	5	0.5	0.4	4	3
3	0.3	0.36	3	0.3	0.09	1	0.1	0.07	5	0.5	0.3	1	0.1	0.08	2.6	8
1	0.1	0.12	3	0.3	0.09	5	0.5	0.35	5	0.5	0.3	5	0.5	0.4	3.2	6
3	0.3	0.36	1	0.1	0.03	3	0.3	0.21	1	0.1	0.06	1	0.1	0.08	1.8	10
1	0.1	0.12	1	0.1	0.03	3	0.3	0.21	1	0.1	0.06	1	0.1	0.08	1.6	11
5	0.5	0.6	5	0.5	0.15	1	0.1	0.07	1	0.1	0.06	1	0.1	0.08	2.8	7
5	0.5	0.6	3	0.3	0.09	5	0.5	0.35	5	0.5	0.3	5	0.5	0.4	4	2
5	0.5	0.6	3	0.3	0.09	5	0.5	0.35	5	0.5	0.3	5	0.5	0.4	3.8	4
															4	
															3.62	4

10 Priority NAPA Projects

10.1 Project profiles

From the short-listed projects, the top two priority activities were developed into brief project profiles that include project rationale or justification, objectives, inputs, short-term outputs, potential long-term outcomes, institutional arrangements, risks and barriers, monitoring and evaluation, and an estimated budget.

10.2 First project profile

Title: Improved water management and use efficiency

Rationale/ justification in relation to climate change

The most significant climatic hazard facing Afghanistan is that of drought. The balance between precipitation and primary productivity is precarious and in much of the country, agricultural production is limited by both the level of precipitation and the length of the dry summer. Drought ultimately endangers the viability of rural livelihoods frequently decimating entire families

and communities, both forcing migration to urban centers in search of work and generating an increase in illegal activities as a switch is made to opium poppy, a crop that resists drought and for which traders provide loans and inputs.

Water is thus a key issue in the livelihoods of Afghan farmers. On an annual basis, it is not sufficient for human consumption, personal hygiene and preventative health care, crop production and animal husbandry. Irrigation water in particular is an extremely precious resource, especially during the hot, dry summers and years of periodic drought. At the same time, inappropriate practices mean that irrigation practices in rural Afghanistan frequently do not result in the most efficient use of water. Together with increases in population density and decreased water availability, families and communities are increasingly boring ever-deeper deep wells. This is having an overall impact on the level of the underground water table and is of questionable sustainability over the longer term.

In order to reduce vulnerabilities to low and fluctuating levels of precipitation, it is imperative to increase the efficiency of water use through improved water management and irrigation systems.



Poorly managed irrigation system in Herat

Objectives

Overall objective

The overall objective of this project will be to reduce livelihood vulnerability in drought-affected communities through improved water management and use efficiency.

Specific objectives

The specific objectives of the project are as follows:

Mainstreaming of climate change and water management issues at a national level;

Introduction and adoption of water-saving irrigation methods, including drip irrigation, and improved canal systems and water storage facilities in target project areas;

Water distribution technologies such as water collection and storage;

Fully formed and functioning Community Water Resource Management Associations taking wise decisions about water resource use and management and facilitating the resolution of associated conflicts;

Local familiarity with, and utilization of, efficient water use technologies increased; and

Public awareness with regards to water resource use and demand side management increased.

Description

Activities

Mandates of MAIL, MRRD and NEPA strengthened with special reference to climate change and water management, and appropriate tools and guidelines developed to enhance analytical skills and inter-sectoral approaches;

Survey of water vulnerable areas, identification of target communities for project implementation. Compilation of data, including mapping, GIS systems and database development;

Realization of participatory discussions with community members to plan and elaborate project implementation plan;

Procurement of equipment and other inputs required for the implementation of the project;

Implementation of project, including:

- Creation and/ or institutional strengthening of water management associations;
- Introduction of drip irrigation;
- Construction of water storage systems and improvement of karezes and canals;
- Investigation of the short and longer term impacts of deep wells on the water table;
- Training and capacity building in efficient water resource use and management; and
- Public awareness raising activities.

Provision of technical support and capacity building to stakeholders including Government (supporting community-based water management projects) and community (conflict resolution and management, maintenance of irrigation systems, etc.).

Inputs

Inputs include technical and financial assistance, equipment and institutional support.

Short-term outputs

Water use efficiency improved thereby decreasing the vulnerability of rural livelihoods;

Stability of agricultural, dairy and fruit production increased;

20 Community Water Resource Management Associations established and fully functioning;

Irrigation systems rehabilitated and improved;

Information on the potential impacts of deep wells on the water table and future supplies of water;

Farmers in target project areas with technical capacity to improve water use efficiency, including knowledge of drip irrigation; and

Improved understanding of the importance of water management.

Long-term outputs

Vulnerability of rural livelihoods in target areas decreased through improved levels of food security;

Participation in the cultivation of illegal crop reduced;

Government staff at a local level experienced in managing both the technical and socio-organizational aspects of water resource management at the community level;

Improved water management and associated benefits observed and adopted by neighboring communities;

Animal husbandry strengthened as rural people are more likely to make longer-term investments; and

Local and national economy strengthened.

Implementation

Institutional or administrative / organizational arrangements

The project will be implemented by MAIL, in partnership with NEPA, the MWE, and local communities. Given that the achievement of project results hinges upon effective community participation, the local Community Water Resource Management Associations will be of fundamental importance to successful project implementation. Technical and managerial support for the implementation of this project will be provided by the local UNEP-Kabul office.

Risks and barriers

The primary risks and barriers that challenge the implementation of this project relate to a shortage of in-country expertise on improved water use and management efficiency. This is augmented by a situation of weak institutional and a lack of specialized equipment. Given that water is such a precious resource for the Afghan people, it is likely that conflicts over water use and management will also emerge from time to time, representing challenges to the development of a coordinated water management system.

Evaluation and monitoring

Evaluation and monitoring of the project will begin with the development of a comprehensive baseline against which key indicators can be monitored. A monitoring system will then be established that adopts a three-tiered approach

involving the Government, UNEP and the local community.

Financial resources

The total value of additional costs required to implement this project is US\$2,200,000.

Length of Project

The project will be implemented over a three year period.

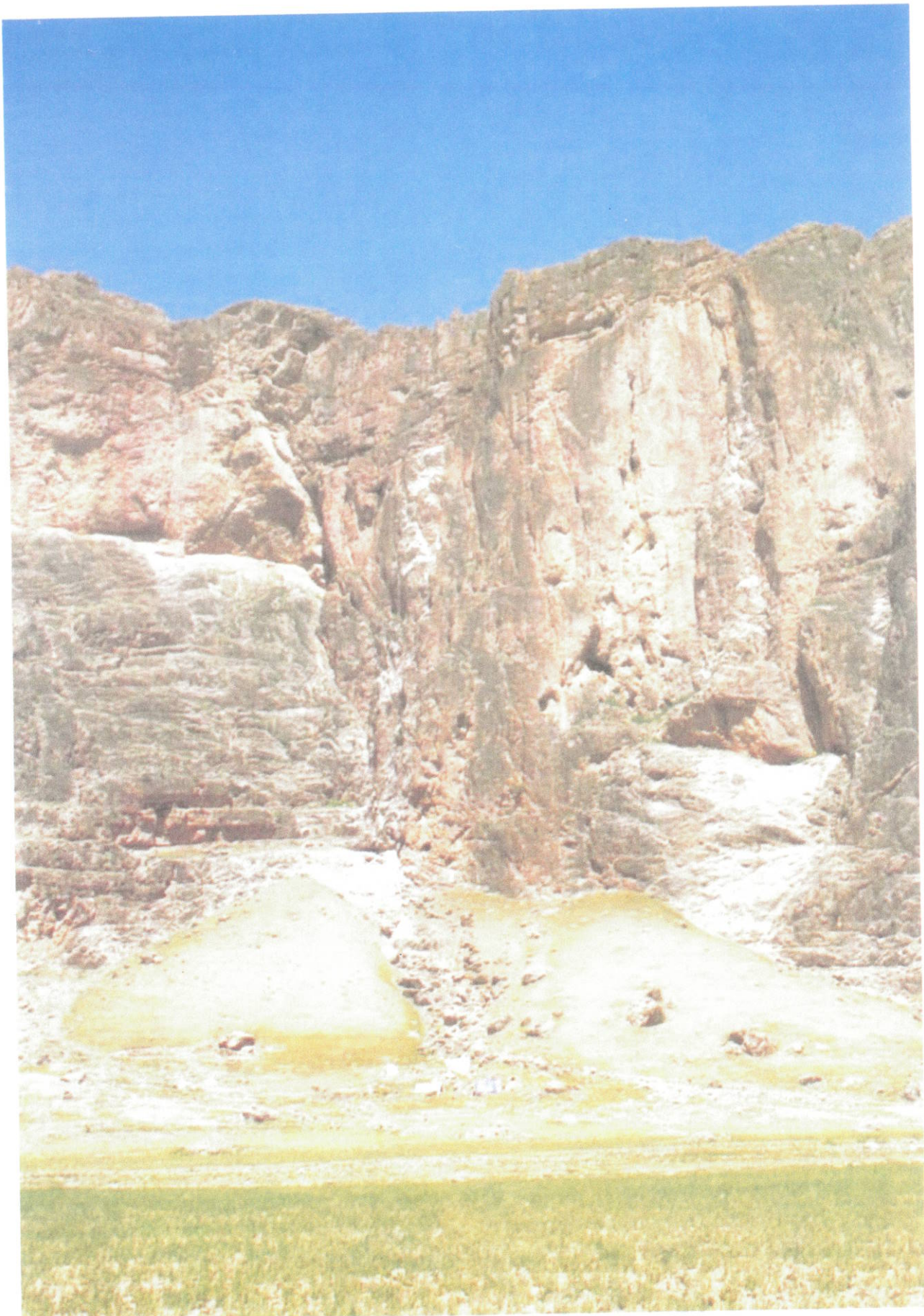
10.3 Second project profile Title: Community based watershed management

Rationale/ justification in relation to climate change

Watershed degradation in Afghanistan is widespread. Short-term management decisions taken by those living in the upper watershed have negative consequences for downstream landholders. Deforestation, overgrazing and trampling simultaneously decrease water percolation and increase run-off and levels of erosion, negatively affecting the productivity of the land in this area. At the same time, downstream landholders are thus subjected to increased frequency and severity of flooding, siltation of irrigation systems, and high variation in water flows.

Water is thus a key issue in the livelihoods of Afghan farmers. On an annual basis, it is not sufficient for human consumption, personal hygiene and preventative health care, crop production and animal husbandry. Experiences elsewhere suggest that a holistic approach with the watershed at the intervention, planning, management and community participation unit has high potential for long-term and sustainable success of environmental management and development interventions.

This project will therefore focus on realizing a holistic intervention in specific watersheds or sub-watersheds. Activities realized will address deforestation and destruction of land cover, soil erosion through wind and rain, flooding, and uncoordinated natural resource management decisions between people living in the upper and lower sections of the watershed.



Degraded watershed in Sar-Rostaq, Takhar

Objectives

Overall objective

The overall objective of this project will be to improve livelihood quality at the watershed level through improved natural resource use and management.

Specific objectives

The specific objectives of the project are as follows:

Mainstreaming of climate change and watershed management issues at a national level;

Fully formed and functioning Watershed Management Committees realizing highly participatory and integrated management of natural resources at a watershed level;

Livelihood security improved through planned natural resource utilization and rehabilitation of degraded areas;

Community members possess sufficient technical and socio-organizational knowledge to be able to take wise decisions natural resource management at the watershed level; and

Public awareness with regard to sustainable natural resource use and management increased.

Description

Activities

Mandates of MAIL, MRRD and NEPA strengthened with special reference to climate change and community-based watershed management, and appropriate tools and guidelines developed to enhance analytical skills and inter-sectoral approaches;

Survey of resource use, livelihood characteristics and natural resource status. Compilation of data, including mapping in GIS system;

Realization of participatory discussions with community members to develop and elaborate project implementation plan;

Procurement of equipment and other inputs required for the implementation of the project;

Implementation of project, including:

- Creation and institutional strengthening of Watershed Management Committees;
- Design and implementation of rotational grazing system;
- Improvement of water-related infrastructure, including construction of water storage systems and improvement of karezes and canals;
- Design and construction/ implementation of soil conservation structures;
- Realizing of interventions that improve livestock quality;
- Designation of protected areas within the watershed;
- Training and capacity building in sustainable natural resource management and the implications of non-sustainable management; and
- Public awareness raising activities.

Provision of technical support from responsible and stakeholder institutions.

Inputs

Inputs include technical and financial assistance, equipment and institutional support.

Short-term outputs

Detailed knowledge about resource use, livelihood characteristics, natural resource status at the watershed level, and social organization;

Improved coordination in watershed management;

Increased stability of agricultural, dairy and fruit production;

20 Watershed Management Committees established and fully functioning;

Irrigation systems rehabilitated and improved;

Rotational systems of grazing introduced and utilized;

Specific activities to increase the value of agricultural production at the watershed level undertaken; and

Improved understanding of the importance of integrated watershed management.



Degraded watershed in Sar-Rostaq, Takhar: unstable uplands are eroding into lower agricultural lands

Long-term outputs

- Vulnerability of rural livelihoods in target areas decreased through integrated watershed management;
- Downstream effects of unsustainable natural resource use and management in the upper watershed are reduced;
- Strengthened local governance systems;
- Government staff at a local level experienced in managing both the technical and socio-organizational aspects of community-based watershed management;
- Improved natural resource management with associated benefits being observed and adopted by neighboring communities;
- Animal husbandry strengthened and associated production levels increased as rural people are more likely to make longer-term investments; and
- Local and national economy strengthened.

Implementation

Institutional or administrative / organizational arrangements

The project will be implemented by MAIL in partnership with NEPA, and local communities. Given that project results hinge upon effective community

participation, the local Watershed Management Committees will be of fundamental importance to successful project implementation. Technical and managerial support for the implementation of this project will be provided by UNEP.

Risks and barriers

The primary risks and barriers that challenge the implementation of this project relate to the shortage of in-country expertise on watershed management. This is augmented by a situation of weak institutional and a lack of specialized equipment. At the local level, it is anticipated that convincing local communities of the benefits of sustainable resource management will be challenging as inevitably they will have to forgo a number of short term benefits in order to improve the overall status of the watershed.

Evaluation and monitoring

Evaluation and monitoring of the project will begin with the development of a comprehensive baseline against which key indicators can be monitored. A monitoring system will then be established that adopts a three-tiered approach involving the Government, UNEP and the local community.

Financial resources

The total value of additional costs required to implement this project is US\$2,200,000.

Length of Project

The project will be implemented over a three year period.

