Government of Niger

United Nations Development Programme

PROJECT DOCUMENT

UNDAF Outcome(s)/Indicator(s):	Vulnerable communities enhance their food security, contribute to sustainable management of natural resources and ameliorate their income
Expected Outcome(s)/Indicator(s):	1. Resilience of food production systems and/or food insecure communities enhanced in the face of climate change. 2. Institutional capacity of the agricultural and water sector enhanced, including information and extension services to respond to climate change, including variability. 3. Lessons learned and knowledge management component established.
Expected Output(s)/Annual Targets:	Output 1.1. Disseminate seeds of tried and tested drought-resilient crop varieties. Output 1.2. Undertake farm trials of drought-resilient crop varieties that are not tried and tested. Output 1.3. Construct and manage cereal banks. Output 1.4. Construct and manage fodder banks. Output 1.5. Construct and manage fertilizer/pesticide shops. Output 1.6. Construct wells and drinking water supplies for both human and livestock use. Output 1.7. Expand the area under irrigation at a village level. Output 1.8. Stabilise soils in agricultural landscapes by constructing banquettes. Output 1.9. Stabilise soils in pastoral landscapes by constructing banquettes, planting trees and sowing seeds of drought-resilient fodder species. Output 1.10. Stabilise dunes around water basins. Output 1.11. Gabions and weirs constructed where loss of river banks to floods is threatening village infrastructure and agricultural land. Output 2.1. Develop institutional capacity to support climate risk management in pastoral and agricultural land management at the national, district and village level. Output 2.2. Develop institutional capacity to incorporate climate change risks into water supply and management. Output 2.3. Develop institutional capacity to create alternative climate-resilient livelihoods for farmers and pastoralists. Output 3.1. Knowledge and lessons learned to support implementation of adaptation measures compiled and disseminated.

Implementing Partner:	National Council for Environment and Sustainable Development
Responsible Parties:	Ministries of Environment, Agriculture, Animal Resources and Livestock Industries, Hydraulics, Finance and Economy, Rural Development Strategy Executive Secretaritat, Municipalities of Sakabal, Tamalo, Aderbissinat, Edouk, Loga, Tondikiwindi, Diffa and Niamey Commune 1

Programme Period: 2009-2013 Programme Component: Project Title: **Implementing NAPA priority interventions to build resilience and adaptive capacity of the agriculture sector to climate change in Niger** Project ID: PIMS 3826 Award / Project IDs: 00058080/00072003 PPG Phase Duration: November 2007 to December 2008 Project Duration: July 2009 to June 2013 (4 years) Management Arrangement: National Execution (National Council for Environment and Sustainable Development)	Total budget: Co-financing: CNEDD: UNDP Niger: GEF/LDCF:	$14,850,000 $10,950,000 $200,000 $200,000 $3,500,000

Agreed by (Implementing Partner)
Director of the Prime Minister Cabinet, Président of CNEDD _____ Date_____

Agreed by
Government of Niger (GON) _____ Date_____

Agreed by
United Nations Development Programme (UNDP) _____ Date_____

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Government of Niger
United Nations Development Programme

PIMS No. 3826

Implementing NAPA priority interventions to build resilience and adaptive capacity of the agriculture sector to climate change in Niger

Brief description

Niger's endemic poverty, dry climate and economic dependence on agriculture make it exceptionally vulnerable to climate change. The overarching goal of the project is to enhance adaptive capacity to climate change in the agriculture and water sectors, with the objective being to implement long-term adaptation measures that increase agricultural productivity, food security and water availability. The project will focus on key adaptation interventions that were identified in the NAPA process as being of high priority by stakeholders at national, departmental, communal and village levels. The interventions will take place at national and local levels, and will include a revision of key national and local development plans. The project's expected outcomes are:

1) resilience of food production systems and/or food insecure communities enhanced in the face of climate change,
2) institutional capacity of the agricultural and water sectors enhanced, including information and extension services to respond to climate change, including variability,
3) lessons learned documented and disseminated, and a knowledge management component established.

Acronyms

AfBD	African Development Bank
AFRICARE	ONG Internationale AMERICAINE
ALM	Adaptation Learning Mechanism
ANN	*Alliance Niger Nature*
APR	Annual Project Report
AQUADEV	*ONG Afrique Verte*
ARFD	*Amélioration des Revenus des Femme de Doso*
AWP	Annual Work Plan
CARE	International American NGO
CBA	Community-based Adaptation Programme
CC	Climate Change
CCA	Common Country Assessment
CNCVC	Committee for Climate Change and Variability
CNEA	*Commission Nationale de l'Eua et de l'Assainissement* [National Water and Sanitation Commission]
CNEDD	National Council for Environment and Sustainable Development
CNI	Initial National Communication
COFO	*Commission Fonciére* [Land Commissions]
COGERAT	Joint Management of the Air and Ténéré Reserve
CRS	Conservation and Land Restoration
DWS	Drinking Water Supply
FAO	Food and Agriculture Organisation
GCM	Global Circulation Models
GEF	Global Environment Facility
GEFSEC	Secretariat of the Global Environment
The GON	Government of Niger
GTZ	*Deutsche Gesellschaft für Technische Zusammenarbeit GmbH* [German Society for Technical Cooperation]
HED	Tamet- Naytional NGO
HPIC	Highly Poor Indebted Countries Initiative
HKI	Helen Heller International
IEC	Information Education Communication
INRAN	National Institute for Agronomical Research of Niger
IPH	Human Poverty Index
IR	Inception Report
IW	Inception Workshop
IWRM	Integrated Water Resources Management
JICA	Japanese International Cooperation Agency
LDC	Least Developed Country
LDCF	Least Developing Countries' Fund
LUCOP	Fight Against Poverty
MoA	Ministry of Agriculture
M&E	Monitoring and Evaluation
MDG	Millennium Development Goals
MoE	Ministry of Environment
NAPA	National Adaptation Programme of Action
NBA	Niger Basin Authority
NEX	National Execution Modality
NGO	Non-Governmental Organizations
NMD	National Meteorological Department
NRM	Natural Resources Management
PAC	*Communicy Action Programme*

PADEB	*Programme d'Appui au Développement de l'Education de Base*
PADL	*Programme d'Appui au Développement Local*
PIP2	*Programme Irrigation Phase 2*
PIR	Project Implementation Review
PNE	*Partenariat National de l'Eau* [Water National Partnership]
PRS	Poverty Reduction Strategy
PRSP	Poverty Reduction Strategy Paper
PSPR	Programme Special du President de la République
RDS	Rural Development Strategy
RDSP	Rural Development Strategy Paper
SCCF	Special Climate Change Fund
SDRP	Fast Track Development and Poverty Reduction Strategy
SEEN	*Société d'Exploitation des Euax du Niger*
SE-SDR	Executive Secretary of the Rural Development Strategy
SIGNER	Niger Geographic Information System
SNPA/CVC	National Strategy and Action Plan for Climate Change
SNC	Second National Communication to the UNFCC
SOS	NGO Sahel International
SPA	GEF's Strategic Priority on Adaptation
SPEN	*Société de Patrimoine des Eaux du Niger*
TA	Thematic Areas
ToR	Terms of Reference
TPR	Tri-partite Review
TTR	Terminal Tri-partite Review
UCRE	ECOWAS Water Coordination Unit
UN	United Nations
UNDP	United Nations Development Programme
UNDP-CO	United Nations Development Programme Country Office
UNDAF	United Nations Development and Assistance Framework
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children Fund
VRA	Vulnerability Reduction Assessment
WHO	World Health Organisation
WMU	Water Management Unit
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PART I: Situation Analysis

Context

1. Niger is one of the poorest countries in the world. UNDP's 2007/2008 Human Development Index ranks it 174 out of a total of 177 countries. Drought, desertification, a fast population growth (estimated at 3.3% in 2006) and the highest fertility rate in the world (an average of 7.1 children per woman) have consistently undermined the Niger economy in recent decades[1]. Today, approximately 60% of Nigeriens live in extreme poverty - defined as a daily income of less than one US dollar.

2. Niger has a predominantly Sahelian climate characterized by great variation in annual rainfall. Data from the Niger National Meteorological Department show that mean temperature and the number of drought years in the 1990's have increased relative to the 1961 – 2001 averages[2]. The increase in temperature follows the general trend for Africa as evident in data presented by the World Meteorological Organization[3]. Particularly devastating multi-year droughts in the past four decades have been attributed to the warming of the Indian Ocean sea surface, which in turn has been ascribed to global warming. These droughts and the variable nature of the Niger climate greatly hamper the development of the country, and have disastrous effects on food security for millions of people. In 2004, for example, a drought and locust invasion resulted in a food deficit of a quarter of a million tons, affecting approximately 2.5 million Nigeriens - 20% of the entire population[4].

3. Development in Niger is also severely constrained by extreme poverty. Factors exacerbating this poverty include drought, malnutrition, high levels of child mortality, limited primary education opportunities, limited access to technology, disease pandemics, ecosystem degradation and regional conflicts. Food security and water availability are likely to be severely compromised by rising temperatures and greater variability in rainfall. Across Niger agricultural producers are operating with limited resources in fragile environments sensitive to even minor shifts in temperature and rainfall patterns. The livelihoods of rural farmers are particularly precarious because of isolation, small farm sizes, lack of secure land tenure, lack of access to technology, lack of access to electricity and fluctuations in global commodity prices and farm inputs. Furthermore, climate information and vulnerability assessments are severely restricted because of a shortage of climate data and very few meteorological stations (Figure 1).

4. Climate projections recently reported by the IPCC AR4[5] show that Africa is very likely to warm (by 3 – 4 ^{o}C)[6] during this century and that the warming will be greater than the global mean temperature increase. The majority of Global Circulation Models (GCM's) indicate that mean annual temperature in the Sahel (which includes Niger) will continue to increase by between 2 and 6° C

[1] CIA World FactBook 2008 (www.cia.gov/library/publications/the-world-factbook/geos/ng.html); fertility rate reference: World Bank 2008 (www.worldbank.org).
[2] Niger National Adaptation Programme of Action, August 2006
[3] Biasutti, M. and A. Giannini. 2006. Robust Sahel drying in response to late 20th century forcings. Geophysical Research Letters 33, L11706, doi:10.1029/2006GL026067 – Source: Project Identification Form, 2006.
[4] US AID U.S. Agency for International Development. Niger – Drought and Locusts July 2005
[5] Christensen, J. H., Hewitson, B., Busuioc, A. et al. 2007. Regional Climate Projections. - In: Solomon, S., Qin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K. B., Tignor, M. and Miller, H. L. (eds.), Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, pp. 848-940.
[6] Under the A1B scenario i.e. projected atmospheric carbon dioxide concentration of 850 parts per million in 2100. This prediction is based on a future world of very rapid economic growth, global population that peaks in mid-century and declines thereafter, and the rapid introduction of new and more efficient technologies, with a balance of fossil intensive and non-fossil energy sources.

within 100 years as a consequence of climate change[7]. In Niger, the recent work conducted under the Second National Communication, has demonstrated that Niger will experience in the next 50 years a temperature increase ranging from 2.5 – 3°C. This will result in considerably greater rates of evapotranspiration, consequently causing a reduction in the amount of water available for plant growth and livestock and human consumption. Already considered an extremely hot and dry country this will have direct consequences on Niger's agriculture[8] and water sectors. The net effect will be reduced agricultural productivity (and hence food security) and fewer sources of potable water for rural communities.

5. The ability of the agricultural sector in Niger to cope with increases in temperature and loss in agricultural productivity is negligible given minimal infrastructure as result of poor investment in sector – only 2% of the national budget in this sector, poor financial resources, and pervasive soil erosion. Other non-climatic drivers leading to reduced productivity in the agricultural sector include: counter-productive farming practices such as overstocking with livestock and ploughing of erodible soils; poor road maintenance and therefore difficulties in getting agricultural produce to market; and increasing rural populations with a concomitant expansion of agriculture into marginal landscapes. Furthermore, only some 10 % of the 27 000 ha of land suitable for irrigation is currently irrigated in Niger[9], leaving Nigerien farmers particularly vulnerable to rainfall fluctuations and increased evapotranspiration. Without adaptation measures the risk of famine and social collapse particularly in rural areas will increase. Rural communities already live near a famine threshold. Unless adaptation measures are put in place, climate change is likely to result in more frequent crossing of that threshold.

6. The predicted temperature increase in Niger will not only affect agricultural productivity but also ecosystem services supplied to rural communities. Greater temperatures and evapotranspiration will, for example, in all likelihood lead to greater wind erosion, a greater incidence of diseases such as malaria, lowering of water tables, lowering of lake levels, reduced fish stocks and loss of biodiversity.

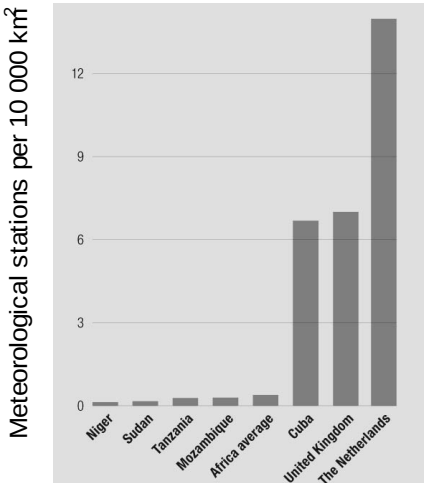

Figure 1: Number of meteorological stations per 10 000 km^2 in a range of different countries [10].

[7] Hulme, M, RM Doherty, T Ngara, MG New, and D Lister. 2001. African climate change: 1900-2100. Climate Research 17:145-168

[8] Factors likely to reduce agricultural productivity as predicted in the SNC work (2007): a tendency to late rainfall onset, reduction of annual mean rainfall, and a decrease in fish production as result of change of water quality due to temperature increase.

[9] Email communication with Garba Radji, Deputy Director of Water Resources in the Ministry of Water, Environment and Combating Desertification, 2 October 2006.

[10] Currently Africa has one weather station for every 25,460 square kilometres. The Netherlands, by contrast has one site for every 716 square kilometres. UNDP Human Development Report 2007/2008.

7. Rainfall projections in the western Sahel are not conclusive, with some models showing significant drying and others simulating a progressive wetting with an expansion of vegetation into the Sahara[11]. The relatively poor consistency in precipitation models is partly because the GCM's are unable to reproduce the mechanisms responsible for the precipitation (such as sea surface temperatures, dust aerosols, deforestation and soil moisture). Any increase in rainfall, however, is likely to be offset (potentially entirely) by warming and loss of water via evapotranspiration.

8. Niger's National Adaptation Programme of Action (NAPA) process, supported by other National processes such as the National Strategy and Action Plan for Climate Change and Variability (SNPA/CVC), established that climate change will have a detrimental effect on the agriculture sector beyond current baseline (non-climate change related) pressures. In light of the heavy reliance that Niger places on rainfed agriculture and pastoralism, the agricultural sector is highly vulnerable to variable (or reductions in average) precipitation over the next 15-20 years. Although there is some uncertainty over the likely long-term direction of projected changes in precipitation levels, the Niger NAPA process established, (and this is supported by the findings of the international scientific community including climatologists, agronomists and economists), that climate change is likely to have adverse effects on the agriculture sector and consequently food security[12].

9. Although the Niger government is actively involved in stimulating the rural economy and increasing agricultural productivity, at present, climate change considerations have not been incorporated into this planning. The behavioural changes that Nigeriens are presently undertaking in order to cope with climate change have not been systematically assessed in order that lessons can be reflected in necessary adjustments in policies and management strategies in the relevant sectors. However, information obtained during the NAPA process suggests that activities such as migration to cities and towns, casual labour, harvesting of edible or medicinal plants in savannas and woodlands, and sale of crop residues are common adaptation responses to climate change. These adjustments are undertaken on an ad hoc basis. A more co-ordinated, systematic and holistic approach to adaptation is required in order to ensure sustainability of adaptation activities.

10. The overarching project **Goal** is to *develop adaptive capacity of the agriculture sector to climate change*. The objective of the project is to *implement urgent and priority interventions that will promote enhanced adaptive capacity of the agricultural sector to address the additional risks posed by climate change*. The project will focus on key adaptation interventions that were identified in the NAPA process as being of high priority by stakeholders at national, departmental, communal and village levels. The interventions will take place at national and local levels, and will include a revision of key national and local development plans.

11. The lessons learned from the proposed intervention will be vital in shaping future adaptation efforts in Niger and the Sahel in general. A knowledge sharing platform will be developed to this end and linked to existing ones such as the Adaptation Learning Mechanism.

12. The proposal is directly aligned with UNDP's comparative advantage in improving capacity building, providing technical support for policy formulation as well as expertise in project design and implementation in relevant areas such as sustainable land management and water governance.

13. The project contributes to the UNDP Country Programme 2009 – 2013 for Niger particularly the sub-programme 2: Environment and sustainable development - a component designed to "support the Niger Government to develop its capacity in the area of climate change including adequate adaptation measures". The project is in line with the major development challenges identified in the

[11] Projects and campaigns that promote tree planting may also have contributed to this spread of vegetative cover into the Sahel (Larwanou, at al, 2007).
[12] Source: Project Identification Form, 2006

revised Poverty Reduction Strategy (PRS: 2008-2012)[13], the new UNDAF (2009-2013)[14] and the UNDP Strategic Plan (2008-2012). The revised PRS and UNDAF identified sound environmental management as one of several key development challenges for Niger's sustainable development.

Threats, and root causes

Threats

14. Modelling (MAGICC/SCENGEN Version 2.4, 2000) of the Niger climate shows a predicted increase in mean monthly temperature of 1.9 ^{o}C, negligible effect on rainfall and a decrease in cloud cover (Annex A). The net effect is likely to be greatly increased rates of evapotranspiration, and concomitant decreases in agricultural productivity in both the livestock and crop sectors.

15. Droughts and flood events are also likely to increase as a result of increases in temperature[15] and, in some predictions, rainfall events[16] in Niger.

16. Agriculture is an integral part of the Niger economy, with pastoralism contributing 10% and crop cultivation 27% to GDP[17]. A decrease in agricultural production is likely to have a negative effect on all other sectors of the economy, thereby potentially threatening the socio-economic and political stability of Nigerien society. For example, reduced agricultural productivity and an increase in the desertification process are likely to lead to greater migration of the rural population into cities. Provision of basic services and amenities for migrants in cities is currently extremely limited.

17. Reduced rainfall and greater temperatures are apparent from meteorological data collected in Niger over the past four decades. Rainfall abnormality data (relative to the mean rainfall over the period 1961-2001) shows that since 1980 rainfall has been consistently reduced across 59 climate stations in Niger. Temperature data for the period 1961 to 2001 show a trend of mean maximum and minimum temperatures increasing over the period 1980 to 2001. In addition, a reduction in river flow has been documented in several major Nigerien rivers (Figure 2).

[13] SDRP 2008-2012: 2.31: Recherche d'une croissance force, diversifiée, durable et créatrice d'emplois. La grappe développement rural : (ii) prévenir les risques, améliorer la sécurité alimentaire et gérer durablement les ressources naturelles pour sécuriser les conditions de vie des populations

[14] Effet UNDAF: D'ici 2013, les populations vulnérables améliorent leur sécurité alimentaire, contribuent à la gestion durable de leurs ressources naturelles et diversifient leurs sources de revenu

[15] Hulme, M, RM Doherty, T Ngara, MG New, and D Lister. 2001. African climate change: 1900-2100. Climate Research 17:145-168

[16] Haarsma, RJ, FM Selten, SL Weber, and M Kliphuis. 2005. Sahel rainfall variability and response to greenhouse warming. Geophysical Research Letters 32, L17702, doi:10.1029/2005GL023232

[17] Email communication with Garba Radji, Deputy Director of Water Resources in the Ministry of Water, Environment and Combating Desertification, 2 October 2006.

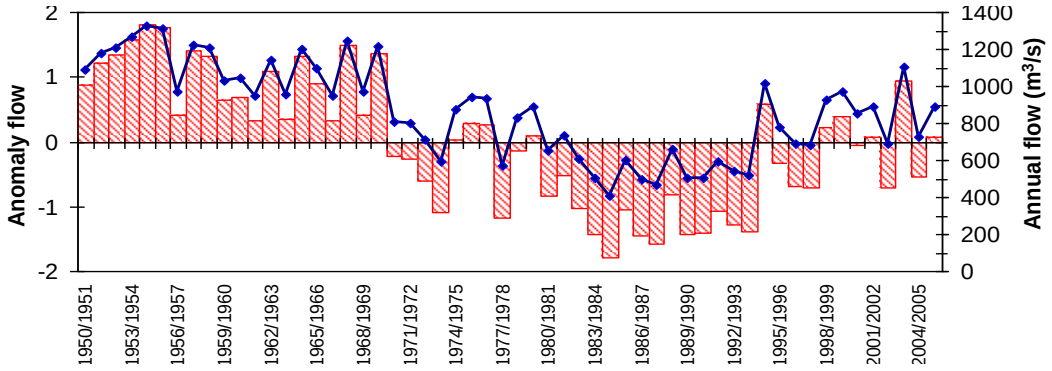

Figure 2: Anomalies (bars) and annual flow (line) of the Niger River at Niamey depicting a reduction in river flows between the years of 1950 and 2005

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18. Further reduction in river flow and surface water availability has potential negative consequences for hydro-electric power generation (on the Niger River), productivity of irrigated agricultural lands and the availability of drinking water for humans and livestock. The costs and likely magnitude of these potential impacts have not been quantified to date.

19. An increase in the frequency of droughts has also been observed in Niger over the past few decades. Millet, sorghum and bean yields based on data from 1975 to 2005 show, in most cases, a trend of decreasing production[18]. The droughts have lead to a decrease in agricultural production, a concomitant increase in grazing pressure on reducing pastoral ecosystems (which are reducing in size due to agricultural encroachment), and consequently soil erosion on a large scale. There is a feedback effect whereby climate change exacerbates loss of soil which in turn further reduces agricultural productivity. The Niger government has recognised this negative spiral as being a major barrier to sustainable development in rural areas as indicated the Rural Development Strategy in which the programme 13 "Land restoration and tree planting" is among the 4 priorities programmes.

20. Many rural communities in Niger obtain their water from natural ponds or lakes. These water sources are replenished by surface flow and seepage of groundwater. An increase in the frequency of droughts as a consequence of climate change has already resulted in the desiccation of numerous ponds, a process that is likely to intensify[19]. The socio-economic effects arising from the loss of these ponds are disastrous and their reduction has resulted in a vastly reduced quality of life for many people. Woman and children, for example, frequently have to walk for an entire day to collect water. The distances to be walked to collect water in the future are likely to increase as climate change effects continue to manifest. The time required to collect water by these vulnerable groups, also has a negative economic effect in that these water bearers are unable to contribute to agricultural productivity.

Root causes

21. There are numerous factors not related to climate that exacerbate the situation of poor agricultural productivity and limited availability of water in Niger. The main factors are documented below.

[18] Source: UNDP National Consultants' Report – April 2008
[19] Niger National Adaptation Programme of Action, August 2006

22. Crop farmers attempt to maintain their income streams in the face of climate change, by planting crops in previously uncultivated landscapes. These areas are often marginal for crop production, because a) the climate is inherently too dry, b) the soils are unsuitable (e.g. highly erodeable or nutrient-poor), c) the topography is too steep, or d) a combination of these factors. The net result is that the returns on the farming investment are poor in comparison to the non-marginal landscapes, and soil erosion tends to manifest as a result of a poor plant cover. The soil erosion again leads to a negative feedback and loss of natural capital, which the rural farmer has great difficulty in controlling.

23. A reduced food supply and income from agriculture as a result of climate change will increase the incidence of malnutrition and starvation across the country. Additional socio-economic impacts of reduced agricultural yields as a result of variable climatic factors include effects such as a reduction in income streams, exacerbation of land conflicts and the deepening of rural poverty. A full list of such impacts is provided in Annex B.

24. Less than 12% of Niger land area is suitable for cultivation and approximately 90% of Nigeriens depend on subsistence agriculture[20]. The cultivation occurs along a narrow semi-arid strip along the southern edge of the country (12% of the 1267 000 sq/km).

25. The price of agricultural produce in Niger has increased dramatically over the past few decades. This is partly a function of a *decrease in domestic supply* due to droughts which have resulted in large-scale loss of livestock and crops and an *increase in demand* mostly from outside the country due to rapid population growth.

Key challenges for adaptation

26. The barriers to increasing the resilience of Niger to climate change are related to the biophysical environment, the availability of financial resources and the institutional capacity in Niger. The main challenges are presented below.

27. Despite its arid climate, Niger has important ground and surface water resources which represent the main water supply of the country. Surface water resources are estimated at about 30 billion m^3 per year[21], non-renewable ground water resources at 2000 billion m^3 and the ground water renewal rate at 2.5 billion m^3 per year. Infrastructure for extracting the water and distributing it to the population is, however, very limited. This is because of a lack of financial resources and often because the deep nature of the aquifers makes it technically difficult to extract the water. A barrier to adaptation in the water sector is consequently appropriating financial resources for sustainably extracting and distributing water to the Nigerien populace.

28. The extraction of groundwater for irrigation and/or drinking water will enhance the resilience of rural Nigeriens to climate change. However, many villages do not have the institutional capacity for raising finance for the required infrastructure and for managing the irrigated landscapes in a sustainable manner. For example, the maintenance of fences, motor pumps and piping requires the establishment of a maintenance fund. This is seldom undertaken effectively because villagers have not been trained in financial management.

29. Furthermore, in order to integrate climate change risks into the water sector appropriately, central planners require information on available water resources. The current data in the Master Plan for Development and Management of Water Resources is outdated (dating back to 1997[22]) and consequently there is a need for further surveys and data analysis. This is a barrier for effective planning at a national level.

[20] Climate Change and African Agriculture. Policy Note No. 32, August 2006, CEEPA
[21] Niger National Adaptation Programme of Action, August 2006
[22] Source: UNDP National Consultants' Report – February 2008

30. Food security after and during disasters such as droughts and floods can potentially be maintained for rural populations through the use of cereal and fodder banks. The availability of such banks in rural areas is, however, limited and there is often mismanagement of the banks where they do exist (details of which are provided in Annex G). Many cereal banks date back to 1968 and, unsurprisingly, several cereal banks require rehabilitation. Cereal and fodder bank management is often controlled by the local village chief and his family. This is a significant barrier to a system that benefits the entire village.

31. The productivity of agriculture (i.e. cropping) in many parts of rural Niger could be increased through the distribution of fertilizers and pesticides. In some villages, shops dedicated to the supply of fertilizers and pesticides have been constructed. These shops are not, however, common place in rural Niger because the institutional capacity at the village, site or department level is not sufficient for either raising finance to construct the shops or for managing the shops.

32. The negative effects of droughts and increased temperatures on crop productivity in Niger can potentially be reduced by planting drought-resistant crops and undertaking rainwater harvesting. The seeds of such crops are not, however, always readily available, and the suitability of different crops in specific regions has not been determined for many varieties.

33. An additional measure for increasing crop production in the face of increasing temperatures and a greater frequency of droughts is the provision of seasonal forecasts to rural farmers. In this way, the farmers can choose appropriate crops for a particular year. In wet years, drought-resistant crops are likely to give lower yields than 'normal' crops. Accurate seasonal forecasts will enable farmers to secure high yields in wet years and maintain moderate yields in dry years. The Niger National Meteorological Department currently does not produce seasonal forecasts at a departmental level and those produced at national level are not delivered in communication channels accessible to local communities. Provision of such information will require downscaling of international models, and at present the technical and hardware capacity for this downscaling is not available in Niger.

34. The provision of appropriate seasonal forecast information will require packaging of the information in a manner that is accessible to illiterate rural farmers. At present the information is too technical for rural farmers. Community radio could be used to distribute the packaged information, however, the current distribution of radio transmitters is limited and a large number of villages do consequently not receive radio broadcasts.

35. Desertification of the Sahel is likely to accelerate with an increase in temperature and if extreme rain events increase in frequency. The construction of mechanical barriers such as banquettes or half-moons which collect rainfall and create zones of high forage production due to conducive condition biophysical activities and have the potential for reversing desertification and increasing the resilience of pastoralists to climate change (Figure 3). However, the barriers require maintenance and the livestock numbers need to be managed in order to prevent degradation of the fodder resource. The institutional capacity (technical as well as administrative) for managing both barriers and livestock, and for raising finance for the management does not exist at the site level. Furthermore, the land tenure system of communal ownership is another barrier preventing effective management of the pastoral landscape.

Figure 3: .An example of a banquette in western Niger near Badoko (photograph: A. Mills)

Stakeholder analysis

36. Project interventions will range from the level of national government to village farmer. During the project design process, steps were undertaken to ensure the involvement of key stakeholders from the outset. During the PPG phase, numerous stakeholders, including local communities, the public sector, the private sector, NGOs and civil society were consulted in order to develop the document. In addition, staff within National Programmes, such as the RDS and PRS, were consulted in order to ascertain the overlap between climate change priorities and sustainable development strategies.

37. A PPG inception workshop was conducted over the period 15-16 November. The workshop was attended by more than 50 stakeholders from government, civil society and non-government organizations. The workshop was opened by the Director of the Prime Minister Cabinet.

38. Key Ministries/National institutions and their role in the project are listed below in Table 1:

Table 1: Ministries/National institutions and their role in the project

Ministries/National institutions	Role in project
Executive Secretariat Rural Development Strategy	• Chairmanship of the Project Preparatory Grant (PPG) Steering Committee • Provided full support in the PPG implementation • Provided technical backstopping in PPG implementation • Ensured the conformity of the FSP with the national policies and strategy • Member of the FSP Steering Committee • Contribute in the monitoring and evaluation of the FSP
Ministry of Environment and Desertification Control	• Member of the PPG and FSP steering committees • Resource institution during PPG for activities related to natural resources management and environment preservation during PPG • Responsible for coordination and implementation of environmental protection and restoration measures in relation to adaptation to climate risk during the FSP
Ministry of Hydraulics	• Member of the PPG and FSP steering committees • Resource institution during PPG for activities related to water resources • Responsible for coordination and implementation of activities related to adaptation of water resources and water sector to climate risk during the FSP
Ministry of Agricultural Development	• Member of the PPG and FSP steering committees • Resource institution during PPG for activities related to agriculture and agricultural production systems during PPG • Responsible for coordination and implementation of activities related to adaptation to climate change risks to agricultural production during the FSP

Ministries/National institutions	Role in project
Ministry of Animal Resources and Livestock Industries	• Definition and implementation of policies and strategies in livestock production sector • Elaboration, implementation, monitoring and evaluation of programmes and projects related to livestock production and animal industries • Elaboration, application and control of legislative and legal framework related to animal production • Amelioration of animal production system • Control of chemical and products utilized in animal production • Monitoring and protection of livestock
National Meteorological Department	• Member of the PPG (1st Vice President) and FSP steering committees • Chairman of the National Technical Commission on Climate Change, Resource institution during PPG for activities related to meteorological information and the implementation of the UNFCCC • Responsible for coordination and implementation of activities related to meteorological information production and dissemination, and capacity building in downscaling of climatic information
Ministry of Finance and Economy	• Member of the PPG and FSP steering committees • Project endorsement on behalf of Niger Government • Ensure the Government co-financing • Ensure monitoring of the project outcome in relation to the national policies and strategies
Ministry of Mines and Energy	• Member of the PPG and FSP steering committees • Ensure technical backstopping in the identification and supply of rural modern energy services
Inter-Ministerial Steering Committee of Rural Development Strategy	• Mandated the RDS Executive Secretariat to monitor the PPG and FSP implementation
National Council of Environment for Sustainable Development	• PPG and FSP national implementation Agency • Member of the Steering Committee Meeting during the PPG and FSP • Nomination of the PPG and FSP Project Director and provision of facilities including building to the project Coordination Unit
University of Niamey	• Member of the Steering Committee Meeting during the PPG and FSP • Technical backstopping during PPG implementation • Collaboration research activities on the drought resistant varieties during the FSP • Provision of training during the FSP
National Institute of Agronomic research of Niger/Ministry of Agricultural Development	• Member of the Steering Committee Meeting during the PPG and FSP • Technical backstopping during PPG implementation • Collaboration in research and monitoring activities on the drought resistant varieties during the FSP • Provision of training during the FSP • Provision of seeds of drought resistant species and training to local stakeholders

39. The identification of sites suitable for demonstrations interventions at a local-level (where communities are recognized to be exceptionally vulnerable to climate change), was undertaken during the NAPA process as follows: government officials in each region of Niger were asked to identify the most vulnerable department; officials in these departments were then asked to identify the most vulnerable commune; and finally commune leaders were asked to identify the most vulnerable village in their commune. The villages were visited by the project team during the NAPA process to ascertain which interventions were most needed for building resilience to climate change. Follow up visits were made during the project preparation phase to ensure that the proposed interventions are still required and supported by the community. The list of key stakeholders consulted is presented in Table 2.

Table 2: List of stakeholders consulted during the PPG phase

Name	Institution
People consulted during the PPG phase:	
Labo Moussa	Chief of the National Meteorological Department.
Daouda Mamoudou	Technical Director of the National Meteorological Department.
Amadou Garba	Technical Adviser on Agriculture and Environment and Director of the Programme Assistance Unit of the Canadian Cooperation in Niger.
Sido Souley	Regional Director of Animal Resources (Niamey), Ministry of Animal Resources and Livestock Industries.
Hassane Saley	Executive Secretary of the National Environment Council for Sustainable Development.
Mrs Manou Aï	Technical Adviser to the National Environment Council for Sustainable Development (CNEDD).
Mrs Bako Safi Solange	Coordinator of the National Adaptation Plan of Action.
Gousmane Moussa	Technical Adviser Climate Change CNEDD, former Coordinator of the National Capacities Self Assessment.
Dorith Von Behaim	Regional Coordinator of the GTZ Programme "Fight Against Poverty".
Garba Radji	Deputy Director of Water Resources in the Ministry of Hydraulic,.
Elhadji Abdou Chaibou	Secretary General of the Ministry of Agricultural Development (MDA).
Kamayé Maâzou	Coordinator of the Second National Communication Climate Change.
Adamou Dan-Guiwa	Director of Studies and Programmes of the Agricultural Development (MDA).
Adamou Bouhari	Programme Analyst, UNDP, Environment Focal Point.
Amadou Seydou	CNEDD Consultant.
People consulted during the field trip: 19 July – 8 August 2008	
DIFFA	
Ado Bala	General Secretary/ Diffa Regional Government
Issoufou Seyni	Chief of Cabinet of the Governor
Kosso Mata Kellou	Regional Director Animal Resources and Livestock Industries
Moustapha Malam Saidou	Regional Director of Environment and Desertification Control
Harou Zouladeini	District Director of the Agricultural Development
Mamadou Moustapha	Regional Director of the Agricultural Development
Hachirou Abdou	Regional Director of Hydraulic
ZINDER	
Irahim Agoumou	General Secretary/ Zinder Regional Government
Mme Adamou Maimouna	Deputy General Secretary/ Zinder Regional Government
Ango Oumarou	Regional Director of the Agricultural Development
Amadou Roufai Moussa	Regional Director of Environment and Desertification Control
Boubacar Yacouba	National Intervention and Security Force (Tanout)
Adji Madougou	National Intervention and Security Force (Tanout)
Souleymane Roufai Kome	Distric Director of Agricultural Department (Tanout)
Zakari Seydou	District Director of Animal Resources and Livestock Industries (Tanout)
MARADI	
Ali Chaibou Maazou	Governor of Maradi Region
Boureima Ide	Deputy General Secretary/ Maradi Regional Government
Koussokoye Aboubacar	Regional Director of Environment and Desertification Control
Tassiou Hamidou	Regional Director of Hydraulic
Abdoulkarim Inoussa	Regional Director of Animal Resources and Livestock Industries
Toure Moussa	Regional Director of the Agricultural Development
TAHOUA	
Sidi Aboubacar	Regional Director of Hydraulic
Maman Ibrahim	Regional Director of Environment and Desertification Control
Moussa Seydou	Kaou sub-district Administrator
Abdoulmani Soumana Hima	Kaou Agricultural District Officer
Mouhamed Balambo Maigari	Edouk
AGADEZ	
Abba Malam Boucar	Gouvernor

Harouna Oumarou Bayaro	Deputy General Secretary Agadez Region
Issa Mano	Regional Agricultural Development Director
Abarchi Idi	Regional Director of Environment and Desertification Control
Mahaman Mayitabo	Regional Director of Animal Resources and Livestock Industries
Illa Jimrao	Regional Director of Rural Engineering
Hassimi Sidi	Regional Director of Land Management
Tchika Mohamed	Mayor of Aderbissanat
NIAMEY	
Amadou Mounkaila	Vice Mayor Niamey Commune I
TILLABERI	
Djibo Atinine	Prefect of Ouallam
Abdoussalam Hamidan	General Secretary /Ouallam District
Amadou Mamane	District Agricultural Development Director/Ouallam
Mounkaila Soumaila	District Animal Resources and Livestock Industries Director/Ouallam
Boubacar Hassane	District Environment and Desertification Control Director
DOSSO	
Habou Mamane	General Secretary, Dosso Region
Ango Alkali	Deputy General Secretary Dosoo Region
Boubacar Amadou	Regional Director Environment and Desertification Control
Marou Assane Koubo	Regional Director Agricultural Development
Soumana Gamatié	Regional Director of Hydraulic
Abdoulaye Naferi	Regional Director Animal Resources and Livestock Industries
Harouna Assakalé	Loga District Administrator (Prefect)
Agali Abdoulaye	District Hydraulic Director/Loga
Idé Ibrahim	District Animal Resources and Livestock Industries Director /Loga

Baseline analysis

40. Development in Niger is constrained by extreme poverty. Factors exacerbating this poverty include malnutrition, high levels of child mortality, limited primary school education opportunities, limited access to technology, disease pandemics, ecosystem degradation and regional conflicts. Food security and water availability are likely to be severely compromised by rising temperatures and greater variability in rainfall. Across Niger agricultural producers are operating with limited resources in fragile environments sensitive to even minor shifts in temperature and rainfall patterns. The livelihoods of rural farmers are particularly precarious because of isolation, small farm sizes, lack of secure land tenure, lack of access to technology, lack of access to electricity and fluctuations in global commodity prices and farm inputs. Furthermore, climate information and vulnerability assessments are severely restricted because of a shortage of climate data and very few meteorological stations.

41. The ability of the agricultural sector in Niger to cope with increases in temperature and loss in agricultural productivity is negligible given minimal infrastructure as result of poor investment in sector – only 2% of the national budget in this sector, poor financial resources, and pervasive soil erosion. Other non-climatic drivers leading to reduced productivity in the agricultural sector include: poor farming practices such as overstocking with livestock and ploughing of erodible soils; poor road maintenance and therefore difficulties in getting agricultural produce to market; and increasing rural populations with a concomitant expansion of agriculture into marginal landscapes. Furthermore, only some 10 % of the 27 000 ha of land suitable for irrigation is currently irrigated in Niger[23], leaving Nigerien farmers particularly vulnerable to rainfall fluctuations and increased evapotranspiration. Without adaptation measures the risk of famine and social collapse particularly in rural areas will increase. Rural communities already live near a famine threshold. Unless adaptation measures are put in place, climate change is likely to result in more frequent crossing of that threshold.

42. Another contributing factor to the agricultural productivity crisis is that the Niger population has grown rapidly in the past decade, and continues to grow at a rate of 3.3%. This excessive population growth has lead to an increase in livestock numbers in pastoral areas[24] and expansion of

[23] Email communication with Garba Radji, Deputy Director of Water Resources in the Ministry of Water, Environment and Combating Desertification, 2 October 2006.

[24] Over the period 1990 to 2002, the number of cattle in Niger increased from 1.7 to 3.5 million and the number of goats from 5 to 9 million. Source: Rural Development Strategy of Niger, 2003.

intensive agriculture into marginal landscapes, resulting in a contribution to the negative spiral of soil erosion and loss of agricultural productivity.

43. Many rural communities in Niger obtain their water from natural ponds or lakes. These water sources are replenished by surface flow and seepage of groundwater. An increase in the frequency of droughts as a consequence of climate change has already resulted in the desiccation of numerous ponds, a process that is likely to intensify[25]. The socio-economic effects arising from the loss of these ponds are disastrous and their reduction has resulted in a vastly reduced quality of life for many people. Woman and children, for example, frequently have to walk for an entire day to collect water. The distances to be walked to collect water in the future are likely to increase as climate change effects continue to manifest. The time required to collect water by these vulnerable groups, also has a negative economic effect in that these water bearers are unable to contribute to agricultural productivity.

44. Although the Niger government is actively involved in stimulating the rural economy, supplying water to rural populations, restoring degraded land and increasing agricultural productivity, at present, climate change considerations have not been incorporated into this planning. The behavioural changes that Nigeriens are presently undertaking in order to cope with climate change have not been studied. However, information obtained during the NAPA process suggests that activities such as migration to cities and towns, casual labour, harvesting of edible or medicinal plants in savannas and woodlands, and sale of crop residues are an adaptation response to climate change. These activities are undertaken on an ad hoc basis. A more co-ordinated approach to adaptation is required in order to ensure sustainability of adaptation activities.

45. Baseline development in the agriculture sector includes several major government initiatives. Firstly, the Special Programme of the President financed by the Highly Poor Indebted Countries Initiative (HPIC) implements soil conservation and water harvesting techniques, including 'Zai'[26] and banquettes[27] in eight regions of Niger (including the Niamey Urban Community). The main objective of this programme is to increase agricultural productivity. The budget for Phase 1 (2001 to 2007) for this component of the project is US$12 million, and to date 500 000 ha of agricultural land has been improved. Secondly, the Ministry of Agriculture has projects that implement water harvesting activities and transfer technology to rural agriculture. And thirdly, the Ministry of Environment is currently implementing a GEF land degradation project (COGERAT), which has a component to increase food productivity in the Aïr–Ténéré Reserve and its adjacent zones (Agadez region), to improve alternative revenue source for the local communities and therefore to reduce the pressure on the Natural Reserve.

46. The GTZ-funded project, LUCOP, also funds the implementation of 'Zai' and other water harvesting measures in cultivated landscapes. Food banks, another method of increasing food supply during droughts and the dry season months, are constructed by various stakeholders such as the Food Crisis Management Body. Other projects funded by donors and government in operation at the eight sites of this LDCF project are detailed in Table 4. All of these projects will contribute to the baseline.

[25] Niger National Adaptation Programme of Action, August 2006

[26] 'Zai' entails digging holes (0.5 m diameter) at intervals of 1-2 m, and filling these holes with a mixture of compost, manure and topsoil. Rainwater runs off the bare soil surface between the holes and ultimately drains into them. In this way, each 'Zai' hole becomes a biological hotspot, with a greater soil-water and nutrient content than the surrounding soil. Crops (e.g. millet, sorghum and maize) are sown in the 'Zai' holes and their productivity is greatly increased relative to plants sown outside of these holes.

[27] Banquettes are trenches approximately 50 cm deep and tens of meters long that form a barrier to wind and surface runoff. They collect dust, surface runoff and soil particles in surface runoff. The trenches become zones of high productivity because of greater soil water content and soil nutrient content than surrounding bare soil surfaces.

47. Although Niger is one of the most vulnerable countries regarding climate change, adaptation is yet to be mainstreamed into the national development policy framework. Niger's PRS and RDS highlight food security, technical and administrative capacity building, provision of water, control of desertification and development of alternative livelihoods as being of paramount importance for sustainable development. The proposed LDCF project is consequently closely aligned with national priorities. However, presently these strategies are largely implemented without taking climate change risks into account. At the local level, regions and municipalities have development plans, and some of them also include risk management plans. These plans at present do also not take climate change into account.

48. Water infrastructure projects are implemented using a participatory approach that empowers beneficiary communities through their full involvement in the design, construction and management of these facilities. Before a community is provided with a water and sanitation facility, it enters into a contract with water resources technical department, whereby it pledges to maintain the facility. These contracts can potentially be amended to take climate change risks into account, but at present do not include this aspect.

49. The National Meteorological Department (NMD) provides weather forecasts for Niger but at present there are major limitations in the use of this information for addressing climate change risks. Seasonal forecasts for specific regions are not available, and the NMD relies on information at a national or continent level provided by meteorological institutes in Europe and United States of America. The information provided is not in a format appropriate for use by rural farmers, and often does not reach the appropriate end users. At present there is insufficient technical capacity in the NMD for addressing these shortfalls in using climate information to adapt to climate change.

50. An understanding of climate change and how to adapt to it is limited to a small group of experts within government and academia. Without this LDCF project, the knowledge exchange within government, academia and the public would be conducted in a haphazard, ad hoc manner. Lessons from planning and implementation of adaptation interventions would consequently not be systematically documented. Furthermore, valuable information derived from the project that pertains specifically to the Sahel would not reach adaptation practitioners in the region, and information that is applicable globally would not reach the potential users.

Institutional, sectoral and policy context

51. Climate change is causing, and will continue to cause, a reduction in agricultural productivity and water availability in the rural areas of Niger. Additionally, poverty, population growth and overstocking of pastoral landscapes are further contributing to the present agriculture/food security and water availability crises. The Niger government and donors are tackling these crises from several fronts. These include a) stimulating the rural economy by providing infrastructure such as roads, schools, hospitals, municipal offices and by developing technical as well as administrative capacity in rural areas, b) improving agricultural productivity by implementing soil conservation and water harvesting measures, c) providing alternative water sources for rural communities.

52. Although the Niger government is actively involved in stimulating the rural economy and increasing agricultural productivity, to date climate change considerations have not been incorporated into an analysis of future agricultural productivity and water supply, although the Second National Communication Studies have demonstrated the predictable impacts of climate change on these sub-sectors (the results of these studies are available). As a consequence, there is likely to be an even greater decline in agricultural productivity and water supply in the future, even if all these baseline activities of the government are undertaken to full effect. In spite of significant achievements (particularly within the framework of the Special Programme of the President of the Republic) and progress made in the implementation of the PRS Niger is not in a position for achieving the most of

Millennium Development Goals (MDGs) by 2015[28] especially those related to the reduction of hunger and malnutrition.

53. Current adaptation practises attempting to overcome pressures brought about by change and variability in Niger, such as rural drift, off-season farming and sale of crop residues, appear to be ineffective in the mid- and long-term. Overall, however, little has been done on a large-scale for achieving adaptability in the longer-term. As a result, in light of the anticipated impacts of climate change on the water and agricultural sector of Niger, populations are currently unlikely to cope with the expected risks. Moreover excessive population growth combined with harsh climatic conditions and inadequate and imprudent use of natural resources has led to ecological imbalances which are expressed in the deterioration of livelihoods. Additionally, Niger's legislative frameworks governing water usage and protection are outdated and do not include adaptation measures. For example, statistical data concerning water resources is obtained from the Master Plan for Development and Management of Water Resources which dates back to 1997. The Water Act is currently being reviewed in order to adapt it to the current policy context.

54. Niger has revised its PRS (first implemented in 2002) in order to give new impetus to its economic and social development policy. Lessons learned from the implementation of the PRS are being used to develop a new innovative vision of development that takes risk into account. This vision was translated into a fast-track poverty reduction strategy (2008-2012 PSRP). Existing and/or ongoing sectoral strategies and policies will serve as an operational framework for such a vision. The first major challenges listed in the PRSP are in line with recommended adaptation measures. These include:

- reduction of vulnerability to external shocks (socio-economic conditions, natural disasters) and the dependence of the economic sector on climatic conditions;
- modernisation and intensification of agriculture and livestock as well as food security;
- sustainable management of natural resources;
- diversification of sources of economic growth, notably by giving priority to employment-generating sectors.

55. In 2003, the GON adopted a Rural Development Strategy (RDS) and in 2006 its Action Plan has been adopted and implementation started through a Programme approach. As a component of the Fast Track Development and Poverty Reduction Strategy (SDRP) in rural areas, it involves 14 programmes. The RDS provides a framework for harmonizing stakeholders' initiatives in the rural sector. Four of these programmes are directly related to agricultural and water resources management, including:

- Programme 2: Local Governance of Natural Resources (i.e. land, water, vegetation, fauna)
- Programme 8: Drinking Water and Sanitation
- Programme 11: Irrigation Development
- Programme 14: Kandadji Programme for Ecosystem Regeneration and Niger River Development

Water management

56. Water resource use and protection in Niger are governed by the provisions of Ordinance N° 93-014 dated 2 March, 1993, related to water regime, revised by law N° 98- 041, dated 7 December, 1998. This is mainly to take into account the recommendations of international conferences (Dublin and Rio Conferences), and decree N° 97-368/PRN/MH/E dated 2 October, 1997.

57. The National Water and Sanitation Policy is based on the concepts of 'access to water for all', 'responsibility of all users to maintain their water points' and the need to protect this resource which

[28] Source: UNDP National Consultants' Report – February 2008

is considered fragile and limited. The policy endorses the four core principles of the Dublin Conference on Water and Sanitation (January 1992) and the recommendations of the Rio United Nations Conference on Environment and Development as well as those of the Second World Water Forum (The Hague, 2000). It also recognizes the need for an integrated approach that addresses both the long-term and short-term needs.

58. A report on the implementation of the Poverty Reduction Strategy Paper (PRSP) (2 July 2004) highlights the importance of sustainable water resources management and provision of drinking water as well as sanitation services. The PRSP and Rural Development Strategy Paper (RDSP) both indicate that water and sanitation are key priorities for the GON. Objectives in these two areas include:

- increasing the coverage rate of peoples' water and sanitation needs;
- improving water sector management based on the following:
  - a sound knowledge of water resources;
  - an increase in surface water mobilization by 10%;
  - supporting agriculture and industry, in collaboration with relevant stakeholders;
  - establishment of an institutional and legal framework, including establishment of a Water Management Unit (WMU);
  - enforcement of legislation pertaining to water resources;
  - a gradual transfer of government responsibilities to local communities and the private sector.

59. According to the Village Water Supply policy, every administrative village must have a modern water point (either a well or borehole), which can supply up to 250 people. Additionally, hamlets with less than 250 inhabitants and which are more than 4 km away from a well or borehole must be provided with a modern water point. Cemented wells are the most common village water supply infrastructure. However, in some areas wells are drilled into bedrock.

60. Water supply in major urban centres is managed by *Société d'Exploitation des Eaux du Niger* (SEEN) and *Société de Patrimoine des Eaux du Niger* (SPEN). SEEN manages 52 centres that supplied water to more than 2.6 million people in 2005. SPEN manages national water supplies in urban and peri-urban areas. SEEN is a private company entrusted by lease contract with the production, transportation and distribution service of public water in urban and peri-urban areas.

61. There are eight major water supply networks in Niger (supplying Niamey, the capital city, and the seven other regional capital cities) and smaller networks in each of 42 medium sized towns. These systems are managed by the SEEN. These facilities supply water to 68.2% of people in the above-mentioned urban areas (reported in 2006).

62. Water supply and sanitation infrastructure and equipment are often obsolete and poorly maintained. This is particularly true of water storage facilities in Niamey and Maradi and water transport systems in Niamey, Maradi and Zinder. Furthermore, industry often lacks appropriate waste treatment systems and produces considerable surface and groundwater pollution.

63. From 2000 to 2006, there has been renewed activity in the water and sanitation sector in Niger. Over this period, 10 546 modern water point equivalents were constructed. One modern water point equivalent is either a borehole equipped with a hand pump or a cemented well. A modern water point can supply drinking water to 250 people in rural areas. In 2007, 1 116 wells equipped with hand pumps, 218 cemented wells and 109 small Drinking Water Supply units (DWS) were constructed across Niger. The DWS units include a borehole or well with a system of pipes for distributing water within a village.

64. Government projects that increase irrigated agriculture, drinking water supply and sanitation are conducted in rural, semi-urban and urban areas of Niger. Such projects are implemented using a participatory approach that empowers beneficiary communities through their full involvement in the design, construction and management of these facilities. The communities involved contribute

financially and establish water management committees. Before a community is provided with a water and sanitation facility, it enters into a contract with the Water Resources Technical Department, whereby it pledges to maintain the facility. Regulations pertaining to the management of water resources are listed in Annex C. A national guide for conducting village water supply programmes was adopted in 1989 and revised in 1992.

Rangeland management

65. Pastoral areas stretching over 227 000 km² and located between the 100 and 300 mm/year isohyets, need to be supplied with water during the dry season. The only available exhaustive inventory of water points (both modern and traditional) in the pastoral area was conducted in 1970. According to this inventory, there were 3 348 water sources, 2 596 of which might be used for animal drinking water. All of these water points are documented in the Niger Geographic Information System (SIGNER). The remaining water points are poorly documented and are considered unreliable. These include semi-permanent water points which rely on rainfall and hence, often cease to exist during drought periods. The erratic nature of such water points is known to cause local migration of rural populations. Further information pertaining to water supply in different agricultural and pastoral sectors is provided in Annex D.

66. The GON introduced in 2006 (not yet adopted) a pastoral development model in agricultural zones by implementing a strategy that increases land security for pastoralists. This strategy focuses on the design, demarcation and sustainable use of rangelands. The strategy is described in the Niger Rural Code adopted in 1993 under the Ministry in charge of agriculture, and recognises the need for pastoralists to have some form of guarantee regarding the use of pastoral resources in their homelands and to move their herds freely over the country in search of grazing.

67. Decree N° 97-007/PRN/MAG/EL recognises the socio-economic and environmental complexity of pastoralism in the Sahel region. It considers pastoralists as "human and social groups who have historically and socially adopted a nomadic way of life and whose main activity is animal husbandry." The statute acknowledges that freedom to move livestock is critical for managing pastoral landscapes given the environmental and climatic constraints of the Sahel.

68. The Niger Rural Code and its accompanying legal texts, progressively enforced from 1993, is aimed at clarifying rules governing land tenure at local, regional and national levels. The objective was not to introduce new rules but to formalise customary laws and to give them the same weight as modern laws[29]. The Code provides for the establishment of a Land Commission (COFO) in each region, department, site and village and for it to be chaired by the Governor, the prefect, the Mayor and the village chief or tribe leader. The COFO is a consultative body that decides on land development criteria (notably demarcation of rangelands), drafts land tenure laws and grants land rights. It also monitors land development and has the authority to transfer undeveloped land to a third party.

69. At the national level, the committee in charge of the Rural Code comprises ministries involved in natural resources management (NRM) and land issues. Details of this mandate are included in Annex E.

70. Pastoralists have adopted the following two migrations to cope with environmental and climatic constraints: a) a northward movement during the rainy season; and b) a southward movement during the dry season in search of permanent water points and suitable pasture.

71. Regulating pastoral activities consists of separating farming zones from pastoral zones by demarcating their boundaries with concrete beacons or natural landmarks (e.g. trees or rivers).

[29] Lund, C. 1993. Waiting for the Rural Code: Perspectives on a Land Tenure Reform in Niger, Issue Paper No. 44. IIED, London.

Farmers are prohibited from cultivating beyond certain limits. If cultivation does occur beyond the demarcated borders, pastoralists are not held responsible for any damages done to their crops. In the same vein, pastoralists are prohibited from encroaching on farmlands with their cattle during the rainy season. Offenders face a fine or imprisonment. These regulations have greatly reduced the number of violent clashes between farmers and pastoralists.

Climate change

72. The Niger Government created a National Technical Committee for Climate Change and Variability (CNCVC) in July 1997. This committee developed the Initial National Communication (CNI, 2000), which was presented at the sixth Conference of the Parties in the Hague (Netherlands) in November 2000, and the NAPA (with the support of UNDP/GEF) in August 2006. In 2004, Niger adopted a National Strategy and Action Plan for Climate Change and Variability (SNPA/CVC, 2003). At present, the CNCVC is developing the Second National Communication for Niger.

73. In addition, Niger is a Party to the United Nations Framework Convention on Climate Change (UNFCCC), having ratified it on 25 July 1995.

Adaptation Alternative Scenario

74. The "adaptation alternative" that this project will contribute towards is the integration of climate change risks that face the agricultural and water resource sectors in Niger into relevant policies, plans and programmes at the national and local level (e.g. Rural Development Strategy and Commune Development Strategies). The project will provide a practical framework and vehicle to guide the process of integrating climate change risks and adaptation into relevant agricultural and water management plans. It will also ensure that decision-makers in the agricultural and water sectors at all levels of government are systematically informed of climate change risks and the costs versus benefits of adaptation. Necessary adjustments in national policies, plans and programmes will be made based on sound technical analysis and wide-spread consultations.

75. At the local level, provincial authorities and community-based organizations will have the capacity to integrate climate change concerns into local agricultural and water development planning processes, and will be able to design locally appropriate solutions to address the impacts of climate change. Countries existing under conditions similar to Niger will have the opportunity to learn from Niger's adaptation mistakes and successes. A knowledge platform will be in place to facilitate this learning process.

76. Demonstration projects at the village level will be used to test and assess adaptation measures that can be up-scaled across Niger and potentially across the Sahel. They will also contribute towards increasing the resilience of currently highly vulnerable villages in Niger to climate change. These villages were identified through a stakeholder participation process during the NAPA that included consultation at national, departmental, site and village levels. Importantly, local capacity will be in put in place to deliver key results and ensure that the interventions are maintained beyond the lifespan of the project. Demonstration measures in vulnerable villages across Niger will include:

- disseminating seeds of drought-resilient crop varieties
- undertaking farm trials of drought-resilient crop varieties
- constructing and managing cereal banks
- constructing and managing fodder banks
- constructing and managing fertilizer/pesticide shops
- constructing wells and/or wells for irrigation and to supply drinking water to humans and livestock
- expanding the area under irrigation at a village level
- stabilising soils in agricultural landscapes by constructing banquettes

- stabilising soils in pastoral landscapes by constructing banquettes, planting trees and sowing seeds of drought-resilient fodder species
- stabilising dunes around water basins

77. School children and university students across Niger will be educated on climate change risks and on appropriate adaptation measures. A systematic mechanism to continuously inform and educate the youth will be established.

78. Capacity will also be developed in the National Meteorological Department to facilitate downscaling of seasonal weather forecasts and packaging of information in a manner appropriate for rural farmers to make informed farm management decisions. This information will be disseminated using communal radio and co-financing will be mobilised for installing radio transmitters in areas that are currently out of range of the radio signal.

PART II: Strategy

79. The project uses a three-pronged approach to reduce the vulnerability of key stakeholders to climate change impacts on the agricultural and water sectors. First, community-based adaptation measures at the local level will increase the availability of food, fodder and water in order to increase the resilience of communities to a warmer, drier and more variable climate. Second, institutional capacity will be strengthened in the agricultural and water sectors in Niger at national, departmental and site levels by integrating climate change risks into government development strategies and plans. The strategies will be at a national level in the form of the Poverty Reduction Strategy and Rural Development Strategy and at a site level in the form of Community Development Plans. Finally, knowledge gained through the project will be shared through the UNDP Adaptation Learning Mechanism with other areas and countries facing similar climate change threats in coastal communities.

Project Rationale and Policy Conformity

80. The proposed project will focus on implementing *urgent and priority* adaptation measures that will increase the resilience of the two most vulnerable sectors, agriculture and water (as identified by the Niger NAPA), to anticipated climate change impacts. The LDCF, initiated at COP-8, was created with the objective of funding urgent and immediate adaptation needs in LDCs as identified in the NAPAs. The proposed project conforms to the UNFCCC criteria for LDCF climate adaptation projects in this regard.

81. In line with the LDCF programming guidance, the proposed project includes a set of measures to enhance adaptation of the agriculture and water resources sectors to address urgent and anticipated climate change impacts. The selection and implementation of measures that meet additional cost reasoning criteria will complement ongoing or planned baseline development measures. The baseline measures will be implemented using co-financing and other sources of bilateral and donor funds.

82. The project will promote climate-resilient development of the agriculture and water sectors. As the project will seek to integrate climate change risks into the agriculture and water sectors, it will directly contribute to the achievement of the MDGs, particularly Goal 1 (extreme poverty and hunger eradication), and Goal 7 (environmental sustainability).

83. The project will work with the relevant stakeholders in the mainstreaming of climate risks into national agricultural and water policies particularly at the Municipality level. It will strengthen monitoring capacities for climate-linked changes in agricultural and water resources as a means to support the design of appropriate agricultural and water management responses. At the local level, pilot activities will seek to improve experiences in implementing anticipatory adaptation responses thereby increasing local awareness of climate related risks and improving adaptive capacity of

vulnerable groups. Special attention will be given to the implementation of adaptation measures on the ground with the participation of local communities and provincial and municipal governments.

Project Goal, Objective, Outcomes and Outputs/Activities

84. In order to reduce the anticipated impact of climate change on the agriculture and water sectors in Niger, an integrated and coordinated sectoral and cross-sectoral approach is necessary. The LDCF is supporting this process through funding of additional costs associated with modifying baseline development programmes in order to promote resilience to climate change. The implementation of the NAPA priorities will largely be adding to and expanding on present government and donor projects.

85. The overarching project **Goal** is "to *develop adaptive capacity of the agriculture sector to climate change"*. The objective of the project is "to *implement urgent and priority interventions that will promote enhanced adaptive capacity of the agricultural sector to address the additional risks posed by climate change*." The project will contribute to MDG Goal 1: eradicating extreme poverty and hunger and MDG Goal 7, Target 9: integrating the principles of sustainable development into country policies and programmes and reversing the loss of environmental resources.

86. The formulation of the project strategy (outcomes and activities listed below) is based on Niger's NAPA that was formulated according to guidance established by the UNFCCC. During the project preparatory period, the formulation of the project document was guided by the steps outlined in UNDP's Adaptation Policy Frameworks document[30]. A vulnerability-based approach was utilized by applying criteria by which climate change risks on agricultural practises and water resources were assessed, taking into account the probability of exceeding a threshold of risk. While all available information was utilized, the project team will complete thorough due-diligence, including in-depth scientific-based analysis of the proposed project funded interventions prior to implementation in order to determine feasibility, cost-effectiveness and ensure that they build on a development baseline.

87. The Project's Expected Outcomes are:

- Resilience of food production systems and/or food insecure communities enhanced in the face of climate change.
- Institutional capacity of the agricultural and water sector enhanced, including information and extension services to respond to climate change, including variability.
- Lessons learned and knowledge management component established.

88. Achieving these Outcomes requires sustainable institutional arrangements that will ensure the adoption of the project's results in the short- and long-term. Project implementation will be through the United Nations Development Programme and execution will be based on the National Execution (NEX) Modality which will seek to establish a bridge between national authorities responsible for formulating and integrating climate change policies and national, regional and local authorities and practitioners of agricultural and water resource management. Knowledge and information provided from monitoring mechanisms, strengthened institutional structures, and pilot projects will enable the development of best practices and a knowledge platform for sharing lessons learned with adaptation practitioners.

Outcome 1: Resilience of food production systems and/or food insecure communities enhanced in the face of climate change.

[30] UNDP, 2005. Adaptation Policy Frameworks for Climate Change: Developing strategies, policies and measures.

Rationale

Baseline Situation

89. The government of Niger and several donor organizations are currently implementing a number of baseline development activities in the agriculture sector. For example, the Special Programme of the President financed by the Highly Poor Indebted Countries Initiative (HPIC) implements soil conservation and water harvesting techniques in eight regions of Niger (including the Niamey Urban Community) in an attempt to increase agricultural productivity. The budget for Phase 1 (2001 to 2007) for this component of the project is US$12 million, and to date 500 000 ha of agricultural land has been improved. The Special Programme of the President also constructs banquettes and plants trees to reduce soil erosion and sows seeds of drought-adapted forage plants. The budget for this programme in 2006 was US$3,2 million, and it is anticipated that the annual budget will increase over the next decade[31].

90. The Special Programme of the President implements the water harvesting techniques of 'Zai'[32] and banquettes[33] in landscapes used for crop cultivation in all regions of Niger. The MoA, too, has numerous projects supporting water harvesting activities and technology transfer to rural agriculture. The Ministry of Environment is currently implementing a GEF land degradation project (COGERAT), which has a component which aims to increase food productivity in the Aïr–Ténéré Reserve and its adjacent zones (Agadez region) to improve alternative revenue source for the local communities so as to reduce the pressure on the Natural Reserve. The GTZ-funded project, LUCOP, also funds the implementation of 'Zai' and other water harvesting measures in cultivated landscapes. Food banks, another method of increasing food supply during droughts and the dry season months, are constructed by various stakeholders such as the Food Crisis Management Body.

Adaptation Alternative

91. The proposed project will build upon these baseline activities. Current interventions to support the agriculture sector do not take risks of climate change, including variability, into account. LDCF resources will meet the additional cost of required interventions, that would be less urgent and necessary if climate change was not an issue.

92. Interventions proposed under Outcome 1 provide opportunities to obtain practical experiences and to develop best practices in climate change risk management in the agriculture sector. This will in turn inform the design of adaptation policy measures. This outcome, while demonstrating adaptations/climate risk management techniques on the ground, will serve to strengthen awareness regarding climate risks, and will increase preparedness and resilience of local communities. Ultimately the implementation of the activities falling under this outcome will contribute towards eradicating food insecurity and equipping communities with the knowledge and tools to ensure future sustainable climate-resilient agricultural practises.

93. Management committees for all the interventions in lieue of this outcome will be established and trained in order to ensure that the measures adopted are sustainable and build on baseline

[31] Information provided by CNEDD, 2 October 2006

[32] 'Zai' entails digging holes (0.5 m diameter) at intervals of 1-2 m, and filling these holes with a mixture of compost, manure and topsoil. Rainwater runs off the bare soil surface between the holes and ultimately drains into them. In this way, each 'Zai' hole becomes a biological hotspot, with a greater soil-water and nutrient content than the surrounding soil. Crops (e.g. millet, sorghum and maize) are sown in the 'Zai' holes and their productivity is greatly increased relative to plants sown outside of these holes.

[33] Banquettes are trenches approximately 50 cm deep and tens of meters long that form a barrier to wind and surface runoff. They collect dust, surface runoff and soil particles in surface runoff. The trenches become zones of high productivity because of greater soil water content and soil nutrient content than surrounding bare soil surfaces.

development activities. The funding of the committees in the long-term will be built into the funding streams generated from the interventions. For example, the extra productivity gained from the soil stabilisation measures will generate additional income, some of which will be set aside for running the committees and for funding the maintenance activities. This principle of raising funds to maintain the committees will be incorporated into the committee protocols.

94. During the NAPA process, several sites that are most vulnerable to climate change impacts were identified in each of Niger's 8 regions (Figure 4). Local stakeholders were consulted during the preparatory phase regarding site selection and on the measures most urgently required to increase the resilience of communities to climate change. Prior to implementation, the project team will undertake additional analysis to ensure and vet that the identified sites remain to be those that are highly vulnerable to climate change, given the best available data on climate change, socio-economic information and scientifically rigorous analytical methods.

95. The project will also be implemented with close consultation with what will conducted during the implementation of the African Adaptation Programme in Niger under the financial support of the Government of Japan.

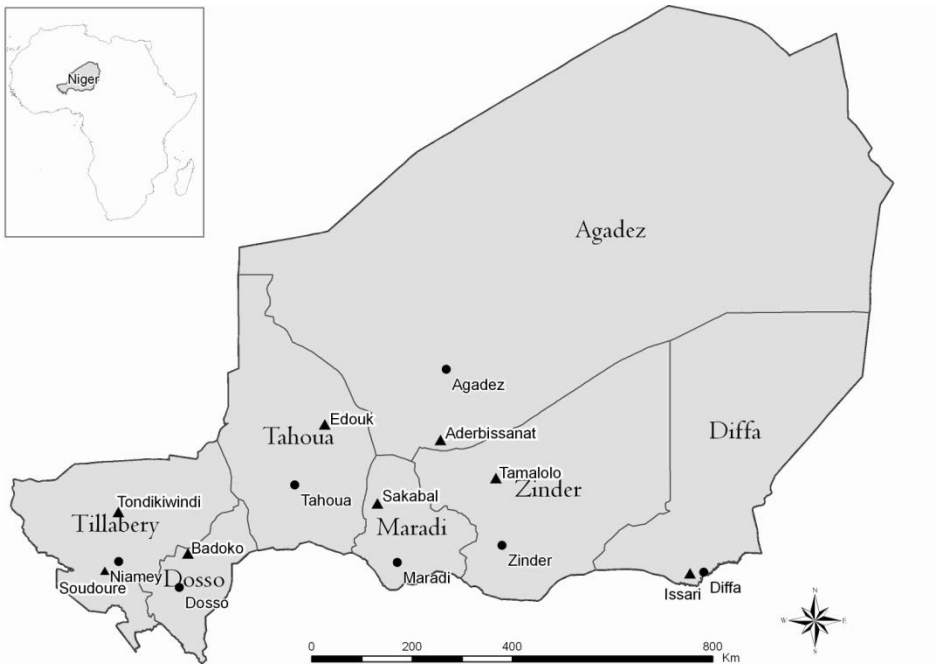


Figure 4: Map of Niger indicating the locations of the eight selected sites (black triangles)

Outputs and activities

Output 1.1. Seeds of tried and tested drought-resilient crop varieties that are likely to be resilient to expected climate change scenarios disseminated

96. One effect of climate change, including variability, on crop cultivation is that many areas where crops have been grown for centuries will no longer be suitable for dryland cultivation (because of reduced soil water content as a result of increased temperatures and evapotranspiration). There are, however, varieties of millet, sorghum, maize and beans that are particularly drought-adapted (see Annex F) and could be used for increasing resilience to climate change, including variability. These varieties have been developed either by local farmers or by National Institute for Agronomical Research of Niger (INRAN) or the International Crops Research Institute for Semi –Arids Tropics (ICRISAT).

97. The barriers to widespread use of these crop varieties include technical capacity and financial constraints. The seed or seedlings of such varieties is frequently unavailable to local farmers because seed or seedlings are not effectively distributed. The proposed project will set up mechanisms for the sustainable diffusion of drought-adapted crop varieties to vulnerable communities. Management committees that are trained to manage cereal banks (see output 1.3 below) will be responsible for sourcing and disseminating seeds or seedlings to local farmers. Without climate change, transition to these crop varieties would not be necessary, making it an additional intervention.

98. All 8 vulnerable sites (Figure 4) will implement this output. The varieties of crops used will differ from site to site (see Annex F). The principle of having cereal bank management committees ensure that seeds are available for local farmers will apply across all sites.

99. Specific activities will include:

1.1.1. Disseminate seeds of drought-resilient crops to at least 50 farmers at each site to enable each farmer to plant at least half a hectare of such crops.
1.1.2. Establish and train management committees of at least 10 members (including five women) at each site to facilitate the adoption of drought-resilient crops by the wider community. The training will include financial, administrative and general management.
1.1.3. Monitor the productivity of the drought-resilient crops relative to other crops grown at the site.

Output 1.2 Farm trials of drought-resilient crop varieties (that are likely to be resilient to expected climate change scenarios and not tried and tested) undertaken

100. Some drought-resilient crop varieties require further testing to ensure that they are appropriate for a particular region. The project will supply seeds and seedlings to pilot farmers to test the yields of different drought-resilient crop varieties and establish their suitability in a particular region under a close collaboration with local farmers, agricultural extension agents and national, regional and international agricultural research centres (eg: INRAN, ICRISAT and Aghrymet). All 8 vulnerable sites will implement this output. Specific activities will include:

1.2.1. Implement demonstration sites of at least 5 hectares of drought-resilient crops that have not been tried and tested, at each site.
1.2.2. Monitor the productivity of these new crops versus conventional crops.

Output 1.3 Cereal banks constructed and managed

101. Food shortages often and do occur for brief periods at the end of the dry season in rural communities, a phenomenon that is likely to increase with climate change. Cereal banks are one method of supplying food during these critical periods. The principle of a cereal bank is that local

farmers can deposit cereal into the bank during times of cereal surplus, earn interest on the deposit and then withdraw the cereal during times of cereal need. The cereal bank also buys in cereal from farmers and the GON at a subsidised rate during times of cereal shortage. The availability of functional cereal banks will need to be intensified in order for commuities to overcome increasinly intense climate pressures.

102. Cereal banks, when managed appropriately, have been demonstrated to function efficiently and achieve the end goal of increasing food security (see Annex G). Mismanagement does, however, frequently lead to misappropriation of the cereal stocks. Existing cereal banks are unevenly distributed among the different regions in Niger and many require rehabilitation. The project will establish cereal bank committees that are elected in a democratic manner and are comprised of women and men. These committees will be trained to manage the cereal bank stocks and to source and disseminate seeds of appropriate drought-resilient crop varieties.

103. Cereal banks will be constructed and/or rehabilitated in the following sites: Issari, Aderbissanant, Badoko, Sakabal, Edouk, Tondikiwindi and Tamalolo. These sites will be revalidated prior to implementation based on the best-available and up-to-date relevant scientific information and methodologies by the project team. Start-up stock for the cereal bank will be purchased by the project and will also serve as revolving funds for the Management Committees.

104. Specific activities will include:

1.3.1. Establish and train management committees of at least 10 members (including five women) to manage the construction and running of cereal banks at each site. The training will include financial, administrative and general management.
1.3.2. Construct and/or rehabilitate cereal banks. The number of cereal banks to be constructed or rehabilitated at each site is detailed in Table 3.
1.3.3. Supply start-up stock for all new and rehabilitated cereal banks.
1.3.4. Monitoring system for cereal bank usage and effectiveness in place

Output 1.4 Fodder/feed banks constructed and managed

105. Fodder shortages often occur for brief periods at the end of the dry season in pastoral communities, a phenomenon that is likely to increase with climate change. Fodder banks are one method of supplying fodder during these critical periods and ensuring that there is not large-scale loss of livestock. The principle of a fodder bank is the same as a cereal bank, namely that local pastoralists can deposit fodder into the bank during times of fodder surplus, earn interest on the deposit and then withdraw the fodder during times of fodder need. The fodder bank also buys in fodder or animal feeds from the GON at a subsidised rate during times of fodder shortage. The availability of functional fodder banks will need to be intensified in order for commuities to overcome increasinly intense climate pressures.

106. Like cereal banks, fodder banks when managed appropriately, have been demonstrated to function well and achieve the end goal of increasing food security (see Annex G). Mismanagement does, however, frequently lead to misappropriation of the fodder stocks. The project will establish fodder bank committees that are elected in a democratic manner and are comprised of women and men members. These committees will be trained to manage the fodder bank stocks. In some commmunes the fodder bank and cereal bank committees will function as one unit. The decision to centralise management of fodder and cereal banks will be taken by the local communities.

107. Fodder banks will be constructed in the following sites: Aderbissanat and Sakabal. These sites will be revalidated prior to implementation based on the best-available and up-to-date relevant scientific information and methodologies by the project team.Start-up stock for the fodder bank will be purchased by the project.

108. Specific activities will include:

1.4.1. Establish and train management committees of at least 10 members (including five women) to manage the construction and running of fodder banks at each site. The training will include financial, administrative and general management.
1.4.2. Construct fodder banks. The number of fodder banks to be constructed at each site is detailed in Table 3.
1.4.3. Supply start-up stock for all new fodder banks.
1.4.4. Monitoring system for fodder bank usage and effectiveness in place

Output 1.5 Fertilizer/pesticide shops constructed and managed

109. There is a strong demand for fertilizers and pesticides in rural areas of Niger in order to increase crop yields, but these commodities are often not available to rural farmers. Climate change is expected to reduce crop yields and consequently increasing the availability of fertilizers and pesticides is one pragmatic method for increasing the resilience of farmers to climate change. The reasons for the lack of availability of fertilizers and pesticides are related to *inter alia* monopolies created by local entrepreneurs, mismanagement the supply chain, lack of infrastructure for storage and recent increases in the price of manufacture. The proposed LDCF project will construct fertilizer/pesticide shops and train management committees for these shops in sites that identified this intervention as high priority, namely Issari, Edouk and Tamalolo. The construction and stocking of these shops will be funded by co-financing in this project.

110. The principle for operating these shops is that fertilizers and pesticides are bought in bulk at a discounted price and transported in bulk to the shop. In this way, prices are reduced to the lowest possible level. Importantly, the shop is a community project and not a profit making venture. It will not set the price of the fertilizers and pesticides according to local market prices, but rather at a lower level which enables the shop to recover running costs.

111. Specific activities will include:

1.5.1. Establish and train management committees of at least 10 members (including five women) to manage the construction and running of fertilizer/pesticide shops at each site. The training will include financial, administrative and general management.
1.5.2. Construct fertilizer/pesticide shops. The number of fertilizer/pesticide shops to be constructed at each site is detailed in Table 3.
1.5.3. Supply start-up stock for all new and rehabilitated fertilizer/pesticide shops.

Output 1.6 Wells and drinking water supplies for both human and livestock use constructed

112. Niger has vast groundwater reserves and present water extraction rates do not exceed the renewal rates. The groundwater reserves have been mapped out and the feasibility of extracting water in rural areas has been thoroughly researched by the government. There is consequently scope for increasing agricultural productivity by sustainably extracting groundwater by means of wells and increasing the existing number of drinking water supply networks (DWS). This has been identified as a key climate change adaptation measure in all vulnerable sites. As temperatures increase, rates of evapotranspiration increase and populations expand, there is also a need for increasing the availability of drinking water for both humans and livestock. The proposed LDCF project will consequently increase the amount of water available for drinking purposes in all sites (apart from Soudouré where the villagers indicated that it was not needed).

113. Specific activities will include:

1.6.1. Construct wells to supply humans and livestock (cement OFEDES wells), supplying pumps and establishing drinking water supply networks. The number of wells, pumps

and networks at each site are detailed in Table 3. Relevant assessments will be undertaken to determine feasibility, cost-effectiveness and due-diligence with respect to environmental and other standards.

1.6.2. Establish and train management committees of at least 10 members (including five women) to manage the wells, pumps and drinking supply networks at each site. The training will include financial, administrative and general management.

1.6.3. Monitoring system for water supply and usage in place

Output 1.7 Area under irrigation at a village level expanded

114. Similarly, as a consequence of increased evapotranspiration as result of increasing temperature and reduced rainfall linked to climate change, the NAPA process highlighted that the area under irrigation at a village level requires expansion. This project will test this form of adaptation response by constructing small-scale wells and distributing water to crop fields through appropriate technologies (e.g drip irrigation at some sites). Committees run by women will be given the responsibility of the irrigated land. There is a precedent in that most irrigated land at a village level is managed by women at present. The committees will be provided with training to ensure that the produce and finances of this community managed initative are managed sustainably and in conjunction with other baseline development initiatives. In addition, crop varieties (typically of vegetables) will be selected by the management committees based on the results of analysis undertaken on the appropriateness and effectiveness of specific varieties under conditions expected with climate change.

115. Additional measures for ensuring the success of the irrigated lands include construction of fences, firebreaks and windbreaks. Irrigation projects tend to fail if the land is not well fenced, because children and livestock often damage the crops.

116. Irrigation projects will be implemented in all of the sites (except for Tamalolo where the villagers indicated that it was not needed)..

117. Specific activities will include:

1.7.1. Construct irrigation wells to supply water to small-scale vegetable gardens. The number of wells at each site is detailed in Table 3. Relevant feasibility and other due-diligence assessments with respect to environmental and other standards will be used in key decisions during the implementation phase.

1.7.2. Establish and train management committees of at least 10 members (including five women) to manage the establishment and running of the new irrigated lands at each site. The training will include financial, administrative and general management. The training will be preceded by in-depth capacity needs analysis.

1.7.3. Fence newly irrigated lands with wire fences and tree/shrub hedges. The extent of the irrigated lands at each site is detailed in Table 3.

1.7.4. Construct firebreaks in the following sites: Aderbissanat, Sakabel and Edouk. Extent of firebreaks is detailed in Table 3.

1.7.5. Construct windbreaks in the following sites: Aderbissanat, Sakabel and Edouk. Extent of firebreaks is detailed in Table 3.

Output 1.8 Soils in degraded agricultural landscapes stabilised by using soil and water conservation measures (CES/DRS), including banquettes

118. Agricultural landscapes used for cropping are prone to severe soil erosion in Niger because of highly dispersive soils and intense rain events. With more intensive rainfall expected in the region as a result of climate change, soil erosion problems are likely to be greatly aggrevated. One mechanism for reducing such additional and more accute problems is to better utilize soil and water conservation

measures and soil protection and restoration measures including banquettes on bare land (See Figure 3; Banquetters are trenches (50 cm deep and tens of meters wide) that trap rainwater and soil particles. Crops are then planted in the trenches. The crop yields from the trenches are higher than surrounding soils because of the greater soil water content and fertility of the silty material in the trench.

119. LDCF resources will be used to pilot strategic use of banquettes in the agricultural landscape in the following sites: Edouk and Soudouré.

120. Specific activities will include:

1.8.1. Construct banquettes. The number of banquettes to be constructed is detailed in Table 3. The size of the banquettes varies according to the soil type and land use. Each site has its own specifications, based on work done by the Special Programme of the President and/or donor projects.
1.8.2. Sow crops in the banquettes. The crop type varies according to region and the amount of rain likely to occur in any particular year. The decision on crop type will thus be made on an annual basis by the project.
1.8.3. Monitor the agricultural productivity of landscapes with banquettes versus landscapes without banquettes.
1.8.4. Establish and train management committees of at least 10 members (including five women) to manage the establishment and maintenance of banquettes at each site. The training will include financial, administrative and general management.

Output 1.9 Soils in pastoral landscapes stabilised using soil and water conservation measures (CES/DRS), including banquettes, planting trees and sowing seeds of drought-resilient fodder species

121. Pastoral landscapes are also prone to severe soil erosion in Niger because of highly dispersive soils and intense rain events. Climate change is likely to lead to a greater intensity of rain events and this will aggrevate the current soil erosion problem. Banquettes (see output 1.8), as in agricultural landscapes, can be used in pastoral landscapes to reduce soil erosion. Fodder tree species and fodder grasses are subsequently planted in and around the banquette trenches. The yields of fodder from the trees and grasses planted near the trenches are higher than surrounding soils because of the greater soil water content and soil nutrient content in the trench.

122. Banquettes will be constructed in pastoral landscapes in the following sites: Aderbissanat, Badoko, Edouk, Tondikiwindi and Tamalolo.

123. Specific activities will include:

1.9.1. Construct banquettes. The number of banquettes to be constructed is detailed in Table 3. The size of the banquettes varies according to the soil type and land use. Each site has its own specifications, based on work done by the Special Programme of the President and/or donor projects.
1.9.2. Sow seeds of drought-resilient grasses in the banquettes, and planting trees adjacent to banquettes. The grass species and tree species to be used in this restoration will vary according to region and according to the availability of seed and seedlings at the time of the project implementation. The decision on what grasses and trees to use will thus be made at the time of project implementation.
1.9.3. Monitor the agricultural productivity of landscapes with banquettes versus landscapes without banquettes.
1.9.4. Establish and train management committees of at least 10 members (including five women) to manage the establishment and maintenance of banquettes at each site. The training will include financial, administrative and general management. The committees will be responsible for activities such as maintaining banquettes, for

planting additional trees and shrubs where required, for sowing additional grass cover where required, and for managing livestock numbers at an appropriate level.

Output 1.10 Dunes around micro-basins stabilised

124. In the Agadez and Diffa regions of Niger, there are numerous oases or water basins that are threatened by shifting sand dunes as a result of climate change and livestock grazing effects. Prior to desertification and loss of the sand dune vegetation these dunes were stable and the oases were the main agricultural zones in the region. Today, numerous of the oases have been lost to the mobile dunes. The Aderbissanat and Issari sites in Agadez and Diffa, respectively, identified stabilisation of dunes around oases as a high priority intervention for increasing the resilience of local communities to climate change. Stabilisation of dunes will protect the agricultural productivity of communities living in the oases. The project will consequently implement this measure using co-financing in these regions. The technique involves planting drought-resilient tree, shrub and grass species in landscapes where dunes threaten the oases. These activities will complement and will build on the achiements of the UNDP/GEF Sand Dune project that will be implemented in two districts in Zinder and Diffa Regions.

125. Specific activities will include:

1.10.1. Plant drought-resilient trees, shrubs and grasses in landscapes in dune landscapes. The plant species to be used in this restoration will vary according to region and according to the availability of seed and seedlings at the time of the project implementation. The decision on what species to use will thus be made at the time of project implementation.
1.10.2. Monitor the agricultural productivity and movement of sand in restored landscapes versus adjacent untreated landscapes.
1.10.3. Establish and train management committees of at least 10 members (including five women) to manage the restoration and the maintenance of the restored site. The training will include financial, administrative and general management.

Output 1.11 Gabions and weirs constructed where loss of river banks to floods is threatening village infrastructure and agricultural land

126. Desertification and soil erosion have lead to increased runoff and consequent destabilisation of river banks in many parts of Niger. Climate change is likely to exacerbate this effect as a result of an increased frequency of heavy rain events, and loss of surface vegetative cover with increased temperatures. As the river banks are eroded, agricultural land is lost and in many regions entire villages are at risk of having buildings and roads engulfed by the flooding rivers. The construction of gabions and weirs can reduce the effects of flooding and stabilise river banks. The project will construct the gabions and weirs (using co-financing) where local stakeholders have identified this measure as a high priority. These include the sites of Soudouré and Sakabal.

127. In addition, the project will improve the management of water catchments by restoring the plant cover to degraded river banks, removing invasive riverine plant species and managing water basins in ecologically appropriate manners. Management of water catchments will be undertaken in Aderbissanat, Badoko, Sakabel and Soudouré.

128. Specific activities will include:

1.11.1. Construct gabions and weirs to stabilise river banks. The magnitude of the stabilisation at different sites is detailed in Table 3. (Predominantly with co-financing). Relevant assessments will be undertaken to determine feasibility, cost-effectiveness and due-diligence with respect to environmental and other standards.
1.11.2. Restore indigenous plant cover to river banks. The extent of restoration at different sites is presented in Table 3. (with co-financing)

1.11.3. Monitor the stabilisation of the river banks at all sites.
1.11.4. Develop and implement climate change sensitive Water Basin Management Schemes at Aderbissanat, Badoko, Sakabel and Soudouré.
1.11.5. Establish and train management committees of at least 10 members (including five women) to manage the river bank stabilisation and the maintenance of the stabilised site. The training will include financial, administrative and general management.

Outcome 2: Institutional capacity of the agricultural and water sector enhanced, including information and extension services to respond to climate change, including variability.

Rationale

Baseline Situation

129. Although Niger is one of the most vulnerable countries regarding climate change, adaptation is yet to be mainstreamed into the national development policy framework. Niger's PRS and RDS highlight food security, technical and administrative capacity building, and provision of water, control of desertification and development of alternative livelihoods as being of paramount importance for sustainable development. However, presently these strategies are largely implemented without taking climate change risks into account. At the local level, regions and municipalities have development plans, and some of them also include risk management plans. These plans at present do also not take climate change into account.

130. Water infrastructure projects are implemented using a participatory approach that empowers beneficiary communities through their full involvement in the design, construction and management of these facilities. Before a community is provided with a water and sanitation facility, it enters into a contract with water resources technical department, whereby it pledges to maintain the facility. These contracts can potentially be amended to take climate change risks into account, but at present do not include this aspect.

131. The NMD provides weather forecasts for Niger but at present there are major limitations in the use of this information for addressing climate change risks. Seasonal forecasts for specific regions are not available, and the NMD relies on information at a national or continent level provided by meteorological institutes in Europe and United States of America. The information provided is not in a format appropriate for use by rural farmers, and often does not reach the appropriate end users. At present there is insufficient technical capacity in the NMD for addressing these shortfalls in using climate information to adapt to climate change.

Adaptation Alternative

132. Adaptation to climate change in the agricultural and water sector requires intervention at several levels. Outcome 1 is comprised of interventions at the site level. In Outcome 2 the focus is on increasing institutional capacity at national, departmental and site levels to integrate climate change risks into their respective short- and long-term strategies and plans that pertain to the agricultural and water sector. The strategies that will be amended will be at a national level in the form of the Poverty Reduction Strategy and Rural Development Strategy and at a site level in the form of the Community Development Plan. The project will also assist government in revising national plans (e.g. PRS and RDS), strategies and legislation pertaining to the agricultural and water sectors in order to integrate climate change risks into planning processes at all levels of government.

133. The proposed LDCF project will also develop the institutional capacity for disseminating appropriate weather forecast information to rural farmers and for addressing seasonal forecasting that can go beyond the actual forecasting period (July – September) and scale (currently at the regional or continental level). UNDP will assist the project team to coordinate with other relevant initiatives, including those led by the Bureau of Crisis Prevention and Recovery in the area of early warning

systems. This will be critical to ensure that the institutional capacity developed with the use of LDCF resources contributes towards short- and long-term orientated agricultural and water resource planning in conjunction with other baseline development initiatives.

Outputs and activities

Output 2.1. Institutional capacity to support climate risk management in pastoral and agricultural land management at the national, district and village level developed

134. There is an opportunity to increase the adaptive capacity of rural farmers to climate change, including variability, by providing short- and medium-term forecasts and training farmers to use the information for agricultural planning. The NMD requires additional technical capacity in the form of IT equipment and staff training to downscale information from meteorological institutes in Europe and USA to a scale relevant for Nigerien farmers. Furthermore, the downscaled information requires repackaging to make it accessible to rural farmers. The project will, in consultation with other ongoing initiatives (such as the National Communications) develop the capacity for the required downscaling and repackaging of the information. Duplication with ongoing initiatives will be avoided at all costs.

135. Community radio will be used to distribute the packaged information. At present, the current distribution of radio transmitters is limited and a large number of villages do not consequently receive radio broadcasts. The project will establish radio transmitting systems for the sustainable broadcast of relevant information in the most vulnerable sites where required. The information disseminated will be tailored to suit both crop farmers and pastoralists.

136. Pastoralists face a different suite of climate change risks to crop farmers. In times of drought pastoralists are can either sell their livestock or move them to areas with greater fodder availability. The movement of livestock has the potential for causing conflict with resident farmers and the proposed LDCF project will review the GON's present pastoral development strategy in this light. The strategy focuses on the design, demarcation and sustainable use of rangelands and is described in the Niger Rural Code. This Code recognises the need for pastoralists to have some form of guarantee regarding the use of pastoral resources in their homelands and to move their herds freely over the country in search of grazing. However, climate change risks have to date not been incorporated into the strategy.

137. The Niger Rural Code provides for the establishment of a Land Commission (COFO) in each region, department, site and village and for it to be chaired by the Governor, the local Prefect, and the Mayor, the village chief or the tribe leader. The COFO is a consultative body that decides on land development criteria (notably demarcation of rangelands), drafts land tenure laws and grants land rights. The proposed LDCF project will work with the COFO in each vulnerable site (Figure 4) to develop local strategies for pastoralists to adapt to climate change.

138. The capacity of departments will also be developed in order to facilitate collection of data from adaptation demonstration projects in Outcome 1 and the analysis of such data. This capacity will vary across departments but may entail provision and maintenance transport equipments to enable technicians to visit the sites and provision of computers to store and analyse data. Importantly, the National Technical Commission for Vulnerability and Climate Change will be supported to ensure that it mobilises resources for the NAPA priority interventions.

139. Lastly, Commune Development Strategies in each vulnerable site will be revised in order to integrate climate change risks into the local development agenda. The results of the demonstration projects in Outcome 1 will be used for motivating revision of the strategies.

140. Specific activities will include:

2.1.1. Train NMD staff to provide short- and medium-term forecasts from downscaling of available data in a format that is suitable for use by subsistence farmers. This training will be ongoing for the duration of the project and will entail consultants working directly with NMD staff to develop and/or configure the appropriate software and databases. A thorough analysis of how to best deliver capacity development services in light of the capacity gaps identified during the PPG phase will be used to inform capacity development activities.
2.1.2. Establish requisite Information Technology (IT) including management systems to support development and dissemination of climate change information at the national and sub-national level.
2.1.3. Review and propose revisions to the Niger Rural Code in terms of adapting to climate change and ensuring that rangelands are used in a sustainable manner.
2.1.4. Develop local strategies that enable pastoralists to adapt to climate change, and lobby for the incorporation of these strategies into planning undertaken by the COFO from a village to a regional level.
2.1.5. Provide IT equipment including necessary training to relevant technical officers in government departments to ensure that data from demonstration projects in outcome 1 are collected, analysed and published. The needs of each department will vary in each year, depending on the government funding available, and consequently technology needs will be decided by the Project Steering Committee on an annual basis during the course of the project. The provision of the equipment will be accompanied by a contract that ensures the delivery of the appropriate data for assessing the efficacy of each demonstration project at each site.
2.1.6. Revise the Commune Development Strategies for each site.

Output 2.2. Institutional capacity to incorporate climate change risks into water supply and management developed

141. This output will focus on the integration of climate change risk into the water sector and in relevant planning processes at the national and provincial level, ensuring that future management decisions take into account the risk of climate change and variability to promote sustainability.

142. Capacity development is required in order to incorporate climate change risks into water management at a national level (i.e. the revised Water Act). The UNDP African Adaptation project (to commence in 2009) will contribute to this mainstreaming. At present the National Water and Sanitation Commission (CNEA) (2006) and Water National Partnership (PNE) (2005) serves as frameworks for exchanging information and training for stakeholders in the water sector. The IEC network comprises: 33 radio stations, 7 televisions stations, 100 community radio stations and 60 newspapers. These frameworks and tools necessary for the effective implementation of the Integrated Water Resources Management (IWRM) approach will be complemented and strengthened. At present, the IWRM Plan is being developed with the technical assistance of the ECOWAS Water Coordination Unit (UCRE) and financial partners (AfDB). The seven Water Management Units, which form the backbone of integrated water management, are being established through the piloting of the Niger river-Liptako management Unit (UGE). All of these units will be consulted during the project.

143. Specific activities include:

2.2.1. Consult local partners and key stakeholders to determine where climate change risks can be incorporated into the existing IWRM Plan.
2.2.2. Develop and lobby for changes to the IWRM plan that ensure climate change is taken into account in Niger's long-term water planning.
2.2.3. Provide training to the appropriate departments to ensure that the recommendations in the IWRM plan with respect to climate change are followed. This training can only be developed once the consultations and recommendations for changes to the plan have

been made. It is likely that there will be a need for modelling climate change impacts on water supplies in different regions, and the potential for using groundwater to alleviate the climate change pressures. The capacity for this type of modelling will need to be developed within the departments.

Output 2.3. Institutional capacity to create alternative climate-resilient livelihoods for farmers and pastoralists developed

144. Climate change has reduced and will further reduce rural income streams as a result of decreased agricultural productivity. In order to develop resilience to this climate change effect, alternative livelihoods for rural communities are required. There is, however, a major barrier to the development of such livelihoods because of lack of technical and administrative capacity in rural areas combined with a lack of appropriate IT infrastructure. The entire rural economy needs to be stimulated to enable alternative livelihoods to develop.

145. Women and the youth represent the groups most vulnerable to the adverse effects of climate change. The multi-year droughts resulting from climate changes have contributed to the decrease of agro-pastoral production in certain areas. This situation has caused the departure of able-bodied people towards urban areas leaving only women and children who are forced into small trading activities. These activities are mainly based on gardening and the sale of products and by-products from livestock breeding, which are themselves affected by the adverse effects of climate change.

146. In order to improve the incomes of vulnerable communities and build their adaptive capacities to the adverse effects of climate change, the promotion of income-generating activities and the development of mutually beneficial societies become necessary. The implementation of a project relating to the promotion of income-generating activities and development of mutually beneficial societies in the areas concerned will contribute not only to the improvement of living conditions of the populations but also to reaching the goals of the PRS. Thus the development of income-generating activities, through the improvement of trade in agricultural produce, the increase in locally manufactured agricultural equipment and the increase in decentralized financing of rural producers constitutes a priority for the PRS.

147. Specific activities will include:

2.3.1. Establish small-scale savings and credit institutions at each project site (i.e. mutual benefit societies).
2.3.2. Train and establish management committees for credit allocation at each site.
2.3.3. Develop facilities for local entrepreneurial activities such as sale of vegetables from irrigated gardens (all sites) and a sewing centre (Soudouré).
2.3.4. Introduce public awareness campaigns on climate change risks and adaptation at a national level and at a site level.
2.3.5. Train school children (local schools at all sites) and university students in environmental sciences (in Niamey) on climate change risks and adaptation. This will include developing a course on climate change for the school curriculum, and educating pupils on the likely effects of climate change and the appropriate adaptation activities for individuals and the country as a whole.
2.3.6. Train school teachers at all sites on climate change and adaptation to climate change.

Outcome 3. Lessons learned and knowledge management component established.

Rationale

Baseline Situation

148. An understanding of climate change and how to adapt to it is limited to a small group of experts within government and academia. Without this LDCF project, the knowledge exchange within government, academia and the public would be conducted in a haphazard, ad hoc manner. Lessons from planning and implementation of adaptation interventions would consequently not be systematically documented. Furthermore, valuable information derived from the project that pertains specifically to the Sahel would not reach adaptation practitioners in the region. Similarly, information that is applicable globally would not reach potential users of that information.

Adaptation Alternative

149. This Outcome ensures that all activities implemented are adequately assessed and the lessons learned from their implementation are disseminated to countries and communities embarking on similar activities. The project will host periodic meetings in relation with schedules set by the Steering Committee, as well as consult with local stakeholders on climate change impacts on agricultural and water resources and possible adaptation to the impending impacts.

150. Lessons from the implementation of the projects are crucial for enhancing the understanding of approaches to adaptation that most countries, especially LDCs, will have to build upon in the future. The LDCF project provides an opportunity to pilot and operationalise interventions that improve adaptive capacity to climate change, including variability. A comprehensive learning component is important so that LDCs can learn from the experiences of each other, as well as for disseminating lessons nationally. Linkages will be made to UNDP-GEF's Adaptation Learning Mechanism (ALM) to ensure that lessons from this project will reach a broader audience including other international agencies, donors and the Secretariat of the Global Environment (GEFSEC) who are likely to be engaged in similar initiatives in other countries.

151. The achievement of the above outcomes will contribute towards lessons on improving resilience to climate change, including variability. These lessons will form a crucial input to inform Niger's plans and strategies to adapt to climate change, including variability, over the coming years. GEF, through the LDCF, will play a pivotal role in enhancing local knowledge and capacities, which will in turn enable Niger to scale up and replicate these interventions.

Outputs and activities

Output 3.1. Knowledge and lessons learned to support implementation of adaptation measures compiled and disseminated

152. A knowledge platform will be created that assists adaptation practitioners within Niger and across the Sahel. Examples of best practices and lessons learnt will be documented both electronically and in hard copy. This knowledge will be made available to a wide range of stakeholders via a project website and be linked to the UNDP's Adaptation Learning Mechanism (see Annex I for recommended templates). A database consisting of data and results from all project activities will also be made available on the website.

153. Best practices and lessons learned will be presented at appropriate seminars and conferences. It will also be packaged in an appropriate format for dissemination to local rural farmers via community radio broadcasts. Additional formats for dissemination to policy makers, the general public and school children will include video documentaries, booklets and pamphlets.

Specific activities will include:

3.1.1. Document lessons learned from the project on a continual basis and present the lessons in a summary document that is distributed to all stakeholders. Lessons will focus on successful or unsuccessful practices in planning, implementing, evaluating and integrating climate change risk management into sectoral development,

approaches including reviews of methods and tools applied (e.g. screening tools, guidelines, etc.), analysis of gaps and others.Prepare and submit all technical reports and documents on lessons learned to the ALM. Lessons learned templates from the ALM will be used for this purpose.

3.1.2. Develop and maintain a project website, which includes a project database and all reports. A mechanism to sustain the site beyond the lifetime of the project must be designed and established.

3.1.3. Develop briefing papers on the lessons learned from the project for publication in a peer-reviewed journal and for presentation at an international conference on adaptation to climate change.

3.1.4. Conduct one national and one regional workshop for dissemination of project lessons within Niger and across the Sahel.

3.1.5. Publish workshop proceedings and distribute these in hardcopy, on CD and on the project website.

3.1.6. Develop videos, booklets and pamphlets on lessons learned for policy makers, the general public and school children.

3.1.7. Develop radio broadcasts to disseminate lessons learned to rural farmers.

154. Outputs and sites for demonstration measures are summarised in Table 2.

155. The costs assumed by the GEF and national counterpart to develop the three outcomes are detailed in Section II, Part I: Additional Costs Matrix.

Table 3: Outputs and corresponding sites for the project outcomes

Outcome/Outputs	**Sites**
Outcome 1: Resilience of food production systems and/or food insecure communities enhanced in the face of climate change	
Output 1.1. Disseminate seeds of tried and tested drought-resilient crop varieties.	All eight vulnerable sites.
Output 1.2 Undertake farm trials of drought-resilient crop varieties that are not tried and tested.	All eight vulnerable sites.
Output 1.3 Construct and manage cereal banks.	Issari, Aderbissanat, Badoko, Sakabal, Edouk, Tondikwindi, Tamalolo.
Output 1.4 Construct and manage fodder banks.	Aderbissanat, Sakabal.
Output 1.5 Construct and manage fertilizer/pesticide shops.	Issari, Edouk, Tamalolo.
Output 1.6 Construct wells and drinking water supplies for both human and livestock use.	Aderbissanat, Badoko, Edouk, Tondikiwindi, Tamalolo, Issari, Sakabal.
Output 1.7 Expand the area under irrigation at a village level.	Aderbissanat, Badoko, Edouk, Tondikiwindi, Soudouré, Issari, Sakabal.
Output 1.8 Stabilise soils in agricultural landscapes by constructing banquettes.	Edouk, Soudouré
Output 1.9 Stabilise soils in pastoral landscapes by constructing banquettes, planting trees and sowing seeds of drought-resilient fodder species.	Aderbissanat, Badoko, Edouk, Tondikiwindi, Tamalolo.
Output 1.10 Stabilise dunes around water basins.	Aderbissanat, Issari.
Output 1.11 Gabions and weirs constructed where loss of river banks to floods is threatening village infrastructure and agricultural land.	Soudouré, Sakabal.
Outcome 2: Institutional capacity of the agricultural and water sector enhanced, including information and extension services to respond to climate change, including variability.	
Output 2.1. Develop institutional capacity to support climate risk management in pastoral and agricultural land management at the national, district and village level.	All eight vulnerable sites.
Output 2.2. Develop institutional capacity to incorporate climate change risks into water supply and management.	All eight vulnerable sites.

Output 2.3. Develop institutional capacity to create alternative climate-resilient livelihoods for farmers and pastoralists.	All eight vulnerable sites
Outcome 3: Lessons learned and knowledge management component established	
Output 3.1. Knowledge and lessons learned to support implementation of adaptation measures compiled and disseminated.	All eight vulnerable sites.

Project Indicators, Risks and Assumptions

Indicators

156. At the level of the project Objective, the indicators will rely on the Vulnerability Reduction Assessment (VRA) methodology, piloted in other GEF adaptation projects, such as the Community-based Adaptation Programme (CBA). The advantages of VRA are:

- It is participatory, incorporating the views of key stakeholder groups regarding changes in their capacity to respond to climate-induced agriculture and water resource sector issues.
- It generates a unit-less index, which can therefore be used to measure and compare progress at different sites within each country. This allows the project management team globally and within each country to practice adaptive management, utilizing regular assessments of changes in VRA to identify required modifications in the project strategy to maximize impact.

157. At the level of the three Outcomes, indicators are:

Outcome 1: (i) Number of adaptation measures implemented at the local level; (ii) Number of communities undertaking adaptation measures; (iii) Number of farmers cultivating drought-adapted crops; (iv) Number of farm trials undertaken; (v) Number of cereal banks rehabilitated, constructed and managed; (vi) Number of fodder banks created and functional; (vii) Number of pesticide shops created and functional; (viii) Number of wells constructed; (ix) Size of area under irrigation expanded at a village level; (x) Number of banquettes constructed in agricultural landscapes; (xi) Number of banquettes constructed, trees planted and drought-adapted seeds sown in pastoral landscapes; (xii) Number of dunes stabilised; (xiii) Number of gabions and weirs constructed.

Outcome 2: (i) Number of institutional agreements to improve climate information networks; (ii) Number of farmers who make use of longer-term meteorological forecast information; (iii) Number of staff trained on incorporation of climate risks in the agriculture and water sectors into the relevant plans; (iv) number of small farmers trained on implementation of adaptation intervention on the ground; (v) number of staff trained at the provincial level on the measurement of impacts of adaptation interventions.

Outcome 3: (i) Number of lessons learned systematized; (ii) Number of cases included in the ALM; (iii) A project website has been created. The target figures for these indicators are: (i) At the time of project completion, at least 3 examples of lessons learned will have been compiled and disseminated; (ii) At the time of project completion, at least 3 examples of best practice generated through the project will be accessible through the ALM; (iii) Within 6 months of the start of implementation, a website on the ALM will be created; (iv) At the time of project completion, draft documents will be prepared to guide future GEF and Ministry of Environment (MoE) support for interventions on adaptation to climate change including variability.

158. The needs expressed by communities at each of the eight vulnerable sites, associated with enhancing the agriculture sector's adaptability to climate change are listed in Table 3. These needs were used for setting targets and benchmarks in the Strategic Results Framework, except for activities relating to soil and water conservation. The extent of land degradation at the project sites is tens of thousands of hectares, and there is consequently scope for expanding the coverage of activities such as banquettes, sand dune stabilisation, water basin management and forage seed spreading. The

additional co-financing raised during the project preparation phase has been largely allocated to such activities.

Table 4: Needs expressed by the communities at each of the eight vulnerable sites in Niger

Activities	Site								
	Aderbissanat	Issari	Badoko	Sakabal	Edouk	Tondikwindi	Tamalolo	Soudouré	Total
Cereal banks	4	1	5.5	4	4.5	5	2.5		**25**
Cereal banks to be strengthened	12								**12**
Fertilizer/pesticide shops		1			1		1		**3**
Fodder banks	12			1					**13**
Irrigation wells	40	3	4	4	10	5		100	**166**
OFEDES wells	6								**6**
Well pumps	40		4	4	10	5		100	**163**
DWS networks	1	1	1	1	1	1	1		**7**
Area to be fenced with wire (ha)		15	20		10	10		100	**155**
Area to be fenced with trees (ha)		15							**15**
Sand dune stabilisation (ha)	40	800			150				**990**
Banquettes forage (ha)	40		400		100	400	400		**1340**
Banquettes agriculture (ha)					70			400	**470**
Water basin management	3		1	10				10	**24**
Forage seed spreading				200					**200**
Gabions (km)								3	**3**
Weirs (number)				2					**2**
Windbreak (km/ha)	20			10	1				**31**
Firebreak (km)	1000			15	500				**1515**
Invasive plant clearing (months per year)								2	**2**
School children education (1 = yes; 0 = no)	1	1	1	1	1	1	1	1	**8**
Sewing centre								1	**1**
Grinding machine								1	**1**

159. For more information and for indicators at the level of Outputs, refer to the Strategic Results Framework in Section II, Part II.

Assumptions and Risks

160. Key assumptions underlying the project design include:

- Stakeholders are able to perceive reductions in vulnerability over the time-scale determined by project duration.
- Stakeholders are able to distinguish vulnerability to climate change from baseline weaknesses in agricultural and water resources management.

- The government remains supportive, politically and financially, to improved agricultural and water resource management.
- Turnover of staff does not negate the benefits of training.
- Communities are sufficiently homogeneous to support community action.
- Provincial and local development plans are implemented.
- Projects are under implementation long enough for lessons to be transferred to other projects before the end of the project.
- ALM becomes operational and effective in time to document best practices from the project.
- NGOs and academic agencies are willing to collaborate.
- Pilot sites are best placed to demonstrate the benefits of measures to adapt to climate change.
- Information available on climate and climate risk reduction is accurate and reliable.
- Adequate incentives for private sector engagement exist.

161. Risks that might affect the success of the project include:

- A series of unusually wet years might weaken the resolve of key stakeholders in addressing water resources issues.
- The slow pace of policy modification may mean that identified policy changes are not implemented in a timely fashion.
- The demonstration projects fail to influence capacity development and policy modification.
- Transaction costs of collaboration among stakeholders are substantial.
- Turnover of government or project staff hinders operations of project.
- Political or security complications in project sites limiting implementation of project activities.
- Further increases in the price of oil render fertilizers unaffordable for rural Nigeriens.

162. Strong commitment from the Niger government limits the likely risks to the proposed project. The main risks are that this commitment is not carried through because of the different perceptions of replaced key decision makers, or that the project does not result in a long-term commitment and strategy to address climate change adaptation for the agriculture and water sectors in an integrated and effective manner. However, linkages made to ongoing and planned baseline development activities implemented by government, securing of the necessary co-financing, as well as local buy-in will minimize these risks.

163. Risks to drought-adapted and dune-stabilising grass and tree planting initiatives include extreme drought, locust invasion and lack of sufficient seed. Weather forecasts can be used to avoid extreme drought impinging on project success, but locust invasions will be difficult to predict. Seed supplies should be sourced well ahead of project implementation.

164. None of these risks are considered to be "high". The most serious risk, rated "Moderate", concerns the slow pace of policy modification. The mitigation strategy to address this risk involves early and consistent application of an awareness programme for policy makers, and engagement of senior levels of government in monitoring project implementation.

165. All other risks are considered to be "Low", and do not warrant a mitigation strategy.

Expected national and local benefits

166. The Sahelian eco- and agricultural systems are very sensitive to even small changes in climate and climate variability. Rainfall patterns are extremely erratic, and can cause floods one year and drought the next. The projected increase in temperature (leading to increased evapotranspiration) and decrease in rainfall will thus further increase climate vulnerability in a society which is already heavily dependent on rainfed agriculture and pastoralism for survival. The adaptive capacity of the

Nigerian farmers and pastoralists to deal with such challenges is at best marginal, and non-climate driven problems such as maladaptive farming practices (e.g. overstocking with livestock and ploughing of erodible soils), low market access due to poor or non-existent roads, and rapidly increasing rural populations leading to expansion of agriculture into previously marginal areas, further exacerbates the situation. Existing problems such as periodic food shortages, unsuitable agricultural practices and recurrent water shortages will undoubtedly only increase unless climate resilience strategies are integrated into development efforts in Niger. This experience will serves the sub-region and the implementation will provides lessons for the adaptation portfolio.

167. The project contributes to the building of adaptive capacity to climate change in the agricultural sector of Niger. At the national level, government, NGOs, and business entities will strengthen capacity to integrate climate change risk reduction strategies into development policies and programmes. National ministries will have developed better-adapted policies and programmes that support planned and autonomous adaptive strategies. Institutional mechanisms for integrating, monitoring and evaluating adaptation across sectors and scales will enhance the adaptive capacity of Niger to address climate change risks. Through better adaptation measures and alternative financing mechanisms, the government will have implemented cost-effective measures of addressing climate change over the short terms and building foundation for middle and long terms measures.

168. At the local level, fishers, farmers, pastoralists, labourers and others in the pilot sites will have strengthened their adaptive capacity to respond to additional risks and uncertainties posed by climate change. In particular women and vulnerable groups, will have enhanced their livelihoods, spread financial risk, and have strengthened skill development and education, thereby reducing their vulnerability. Local governments and management institutions will be more accountable and transparent, and will integrate climate change adaptation and disaster risk reduction into long-term development planning strategies.

169. Adaptation to climate change projects must take into consideration "on the ground" interventions at the local level. The success of adaptation policy, measures and strategies will be measured in terms of increased awareness, preparedness and resilience to climate hazards in local communities. Field-based activities in adaptation are important because they provide opportunities to obtain practical experiences which could be improved.

170. The project will focus its "on the ground" interventions on agricultural and water management in sensitive areas and with vulnerable populations. This capacity development component will be devised to raise awareness of climate risks, and increase preparedness and prevention policies at the local level.

171. The project will benefit local communities by improving the reliability of water supply for agricultural production, especially for small farmers. More reliable water supplies will also improve agricultural yields, thus increasing average incomes and improving nutrition. Moreover, agricultural production will also be increased through the introduction of drought-adapted crops. In addition alternative livelihoods for rural communities will be introduced to enhance their resilience in the face of climate change. The impact of droughts will be mitigated, to an extent, with the establishment of fodder banks.

172. Lessons learned from the implementation of projects will be disseminated to other regions/countries embarking on similar ventures to refine project strategies for the early achievement of results. Overall a better understanding of adaptation mechanisms will be achieved.

Country Ownership: Country Eligibility and Country Drivenness

173. Niger is a Party to the UNFCCC, having ratified it on 25 July 1995. It is also one of the LDC, as identified by the Economic and Social Council of the United Nations. The UNDP Human

Development Index listed Niger as the poorest country in the world in 2005 and 159th (out of 177) in 2006 [34]. Climate change effects will exacerbate poverty in Niger and adaptation measures consequently require urgent attention.

174. In July 1997, the Niger government created a technical CNCVC. This committee developed the Initial National Communication (CNI, 2000). The proposed project is consistent with priorities specified in the CNI, the SNPA/CVC (2003), and the Niger NAPA (2006). It is also consistent with priorities of sustainable development as stipulated in the National Programme of Action to Combat Desertification and for Natural Resources Management (1998) (PAN-LCD), the RDS (2003) and the PRS (2002).

175. The preparation of the NAPA was guided from decisions stemming from the Marrakech COP7, particularly the decisions 5/CP7 (assistance for adaptation in developing countries), 27/CP7 (directives relating to funds for LDCs), 28/CP7 (guidelines relating to the NAPA), and 29/CP7 (setting up of the Least Developed Countries (LDC) Experts Group). The NAPA was also drawn up to comply with the Niger National Environmental Plan for a Sustainable Development (PNEDD).

176. The INC, SNPA/CVC and the NAPA provide an assessment of potentially major impacts of climate change on sectors that are essential for development in Niger, and state that the agriculture and water sectors, in particular, require urgent attention. The documents were developed in consultation with numerous stakeholders, including local communities, the public sector, the private sector, NGOs and civil society. Staff within National Programmes, such as the RDS and the PRS, was consulted in order to ascertain the overlap between climate change priorities and sustainable development strategies.

Sustainability

177. The project will enhance the adaptive capacity of social and ecological systems to climate change impact thereby promoting sustainability. In addition, national institutional capacity will be strengthened to mainstreaming climate change adaptation and community-based adaptation. Such activities will be replicated and scaled up through advocacy and training, thereby ensuring sustainability of project benefits after project completion. The project will prioritise interventions with sustainable operational models that involve (i) specific activities that can occur within budgets and on-going programmes of existing line agencies; and (ii) a strong focus on private sector involvement in areas (such as insurance, credit, communications, and economic diversification) where market incentives can sustain private sector interest. Finally, sustainability will be ensured by including results within adaptation learning mechanisms, the Second National Communication to the UNFCC (SNC) process and a broader adaptation framework.

178. Sustainability is an integral part of the project design. The sustainability of the project's results will largely depend on the effectiveness of stakeholder involvement, the appropriateness of the implementation of the adaptation measures whilst using international best practices, adequate technical, legal and institutional capacity and expertise at the national level, and long-term political and financial commitment of policy-makers.

179. The concept of sustainability differs for adaptation to climate change projects, compared with other types of GEF-funded projects. This is because adaptation projects seek to raise the adaptive capacity to long-term climate change. Consequently, raised adaptive capacity automatically implies sustainability. Of greater concern is the risk that the raised adaptive capacity is eroded over time such that as the impacts of climate change are experienced, the benefits secured through the GEF project are not realized. To avoid this situation, the project design relies on the following elements:

[34] UNDP, 2006. Human Development Report. http://hdr.undp.org/

- A commitment to long-term planning at all levels, from strategies (such as promotion of inter-sectoral decision-making through inter-sectoral fora) to policies, to specific intervention measures.
- Building of multi-sectoral teams, to allow climate-change adaptation to be integrated into planning in a wide range of sectors;
- Explicit consideration of costs and benefits, with endorsement of strategies, policies and measures only if they can be expected to provide overall net benefits to sustainable development;
- Commitment to continuous monitoring and regular evaluation of interventions over time; and inclusion of awareness-building and fund-raising amongst national and international agencies and donors as a core activity.

180. Finally, the global flow of information on climate change has markedly increased national consciousness about climate change, its causes and impacts. A positive attitude towards "doing something" to address climate change can be noticed at all levels. This will improve the proposed adaptation measures' chances of success.

Reliability

181. Climate change adaptation is at an early stage of development both in Niger and in the rest of the Sahel. This project is therefore explicitly designed to pilot adaptation in Niger subject to the broadest possible range of climatic vulnerabilities to different kinds of agricultural and water governance issues, but which have reasonable capacity in terms of infrastructure and human resources. By developing systemic capacity while demonstrating adaptation measures on the ground, the project will establish the conditions necessary for replication and scale up. Project results will certainly be replicable in other countries forming part of the Sahel as a result of their similar climatic conditions and shared vulnerability.

182. A UNDP-GEF led adaptation to climate change project for the agriculture and water sectors in Niger would provide substantial lessons to replicate in other LDCs, as well as other countries, facing similar challenges. The selected interventions will demonstrate that adaptation planning and implementation can have practical outcomes that provide tangible benefits. These benefits can in turn be fully integrated into national policy and sustainable development planning.

183. Niger is one of the poorest countries in the world, and consequently the challenge of developing resilience in rural communities is greater than in most other regions of the world. As a result, there are likely to be valuable lessons learnt from implementing adaptation initiatives. Measures that work in Niger are likely to be suitable for replicating in other poor, arid countries. The outputs and outcomes of all project components will also have important demonstrative value with significant potential for replication within Niger.

184. The project will make use of the GEF ALM, to ensure that the lessons learnt from the project contribute to, and benefit from, experience in adapting to climate change across the whole of the GEF portfolio. During submission, a template of anticipated lessons learnt will be included with the FSP Brief.

Linkages with other programmes and action plans at regional and sub-regional levels

185. The proposed project will contribute to meeting the objectives that are set out in the UNDP Country Partnership Action Programme CPAP 2008-2013 for Niger, and will be implemented within the context of that programme. It particularly contributes to the Outcome 7 "National Capacity reinforced in the area of climate change mitigation and adaptation" of the Country Programme. Furthermore, the project is in line with the major development challenges identified in RDS (Strategic Axe 2: Prevent risk, enhance food security and manage natural resources in sustainable manner to

secure the living conditions of the population and Strategic and Strategic axe 3 : build the capacity of natural institution and rural organizations to foster the rural sector management") and confirmed in the new Poverty Reduction Strategy which is currently being finalized and on which the UNDAF is aligned.

186. The Poverty Reduction Strategy identified sound environmental management as one of several key challenges for the sustainable development of Niger. The project w ill contributes to the UNDAF Outcome "From now to 2013, the vulnerable population enhanced their food security, contribute to sustainable management of natural resources and diversified their revenue sources". At UNDP corporate level, the project will contribute to the outcome "Strengthened capacity of developing countries to mainstream climate change adaptation policies into national development plans based on improved understanding of the linkages between climate change and other development issues and gender-differentiated impacts".

187. The African Adaptation Programme (funded by the Government of Japan) in which Niger is part of the beneficiary countries will be aligned with and will build on this NAPA follow up project. While the NAPA follow up project will address the urgent need identified in NAPA, the African Adaptation Programme will fill the institutional gap at national and local level and will support the development of long term adaptation measures.

188. Projects already operating in the eight sites are detailed in Table 4. These projects will contribute to the NAPA follow up baseline.

Table 5: Additional projects in progress in the eight vulnerable sites

Project	Description	Sites
PADL :Programme d'Appui au Développement Local financed AfDB	Local development	Issari, Tamalolo
CARE Intenational American NGO	Local development and alternative livelihood	Issari
PSPR Programme Spécial du Président de la République/	Activities related to environmental restoration, and education of alternative livelihoods.	Issari, Sakabal, Edouk, Aderbissanat, Soudouré, Tondikwindi, Badoko.
CCA : Cellulle Crise Alimentaire	Management of food availability and crisis	Issari
AQUADEV	NGO working in Rural Development	Tamalolo
CRS: Catholic Relief Service	NGO working in rural development	Tamalolo
HKI : Helen Keler International/American NGO	working on nutrition, health, AGR	Tamalolo
PSSP		Tamalolo
PASEHA		Tamalolo
NGO Tamakara	Community development	Edouk
		Edouk
JICA : Japaneese Internatioanl Agency	Rural Development Cooperation	Edouk
FAO (Food and agriculture organization)	Agriculture productivity promotion activities	Edouk, Tondikwindi
UNICEF (United Nations Children Fund)	Heath and Education	Edouk
ONG TADRESS	Community development	Aderbissanat
AFRICARE American NGO	Rural Development and alternative livelihood	Aderbissanat
HED-TAMET Local NGO	Community Development	Aderbissanat
CESAK		Aderbissanat
TAKAY		Aderbissanat
SOS	Rural Development	Tondikwindi
LUCOP (GTZ): Lutte Contre la Pauvreté	Germany financed project working on environment protection, local development and capacity building	Tondikwindi

ZARESSE	Italie – CILSS financed project working on Local Development	Badoko
AFRD		Badoko
PIP2: Programme Petite Irrigation 2	Irrigation and natural resources management	Badoko
ANN: Alliance Niger Nature	Local NGO working on community development	Badoko
PADEB: Projet d'Appui au Dévelopement de l'Education de Base	Education	Badoko

PART III: Management Arrangements

189. The project will be implemented over a period of four years beginning in July 2009. The project will be nationally executed under UNDP National Execution (NEX) procedures. The lead Executing Agency for the project will be the National Council for Environment and Sustainable Development (CNEDD). CNEDD will appoint a National Director for the project and can serve as the focal point for the National Commission for Climate Change and Variability and its Secretariat

190. Implementation arrangements seek to establish a bridge between: i) national authorities responsible for formulating and integrating climate change policies; ii) national, regional and local authorities responsible for project implementation; and iii) on-the-ground practitioners of agricultural and water resource management. Continual monitoring of project progress at all scales (national to village) will generate lessons learned that will be used to develop effective coordination between all project stakeholders.

191. The National Council for Environmentally Sustainable Development (CNEDD) will manage the project through a Project Co-ordination Unit and will delegate specific project activities to appropriate ministries and institutions, including the Ministry of Environment and Desertification Control, the Ministry of Animal Resources and Livestock Industries, the Ministry of Agricultural Development, and the Ministry of Hydraulics. A capacity needs analysis will be undertaken prior to implementation to identify and provide necessary support and training needs in such institutions to ensure results are delivered on time, within scope and on budget. The responsibilities of each ministry and institution are detailed in the Stakeholder Involvement Plan (Part IV; Table 15). The ministries and institutions will all be encouraged to incorporate the project activities within their own current programmes or plans, in order to mainstream them and thereby develop national ownership of the project. This type of project management arrangement is already in place for all environment programmes within the Rural Development Strategy.

192. Importantly, the project management arrangements proposed for this LDCF project are in accordance with the Paris Declaration (of which Niger is a signatory). This declaration recommends that stakeholders move away from a more traditional project approach with large Project Management Units, and rather establish small Project Co-ordination Units housed within the national implementing partner. This type of management structure ensures that capacity is built within local ministries and institutions and not primarily within a Project Management Unit that is ultimately disbanded at the end of the project. It consequently builds greater levels of national ownership than the more traditional project approach.

193. **Project Co-ordination Unit (PCU).** The role of the PCU in this LDCF project will be to: i) ensure all ministries are complying with their project commitments; ii) co-ordinate meetings with the ministries and PSC meetings; iii) manage finances; iii) undertake all reporting commitments; iv) undertake budget revisions; and v) undertake monitoring and evaluation. Staff will comprise a project director, two administration and financial assistants, and a monitoring and evaluation expert. National and international consultants will also be contracted to oversee and advise on all project activities. The project director will be nominated by the CNEDD and will be responsible for co-ordinating the implementation of the project and ensuring synergy with other adaptation initiatives.

194. **Rural Development Strategy Inter-Ministerial Committee.** As a project contributing to the RDS implementation, this LDCF project will be overseen by the Rural Development Strategy Inter-Ministerial Committee which is the highest political body for oversight of rural development activities in Niger. This committee will provide direction and overall strategic guidance to project implementation, and will ensure that the project delivers in line with both the project objectives, as well as the RDS objectives. Specific attributions of the Rural Development Strategy Inter-Ministerial Committee include: i) to take care of the internalisation and appropriation of the RDS by the various institutions of the State and their partners, ii) to define the measurable specific objectives and the means for the implementation of the RDS plan of action, iii) to coordinate the mobilization of the financing necessary for the implementation of the RDS, iv) to coordinate the dialogue between partners with the development for the implementation of the RDS, v) to coordinate the implementation of the RDS programmes, vi) to propose the legislation and lawful measures to facilitate the establishment of the RDS to the GON, vii) to inform the GON of updates or changes in the policy of field of rural development and viii) to ensure that the follow up and evaluation of the RDS are undertaken and that the results are considered in the RDS.

195. **Project Steering Committee (PSC).** A PSC, residing below the RDS Inter-Ministerial Committee, will be formed to provide oversight on project management. The PSC will be chaired by a person designated by the Inter-Ministerial Committee of the Rural Development Strategy. It is anticipated that the Executive Secretariat of the CNEDD and the PSC will comprise representatives from the National Climate Change Commission, Ministry of Environment and Desertification Control, the Ministry of Animal Resources and Livestock Industries, the Ministry of Agricultural Development, the Ministry of Hydraulics and the National Council for Environmentally Sustainable Development (CNEDD), and other departments and civil society represented in the SE-SDR as well as representatives of the United Nations Development Programme. The PSC will take full responsibility for overall consultation, coordination and collaboration.

196. The PSC will make policy decisions (in line with the agreed project document and UN Rules and Regulations), as well as guide and oversee progress of the project and review delivery targets and budgetary issues. The SE-SDR will chair the Committee, while the Directorate of Meteorology and Ministry in charge of environment will be respectively the 1st and 2nd Vice Chairpersons as indicated in the National Commission for Climate Change and Variability (Figure 5).

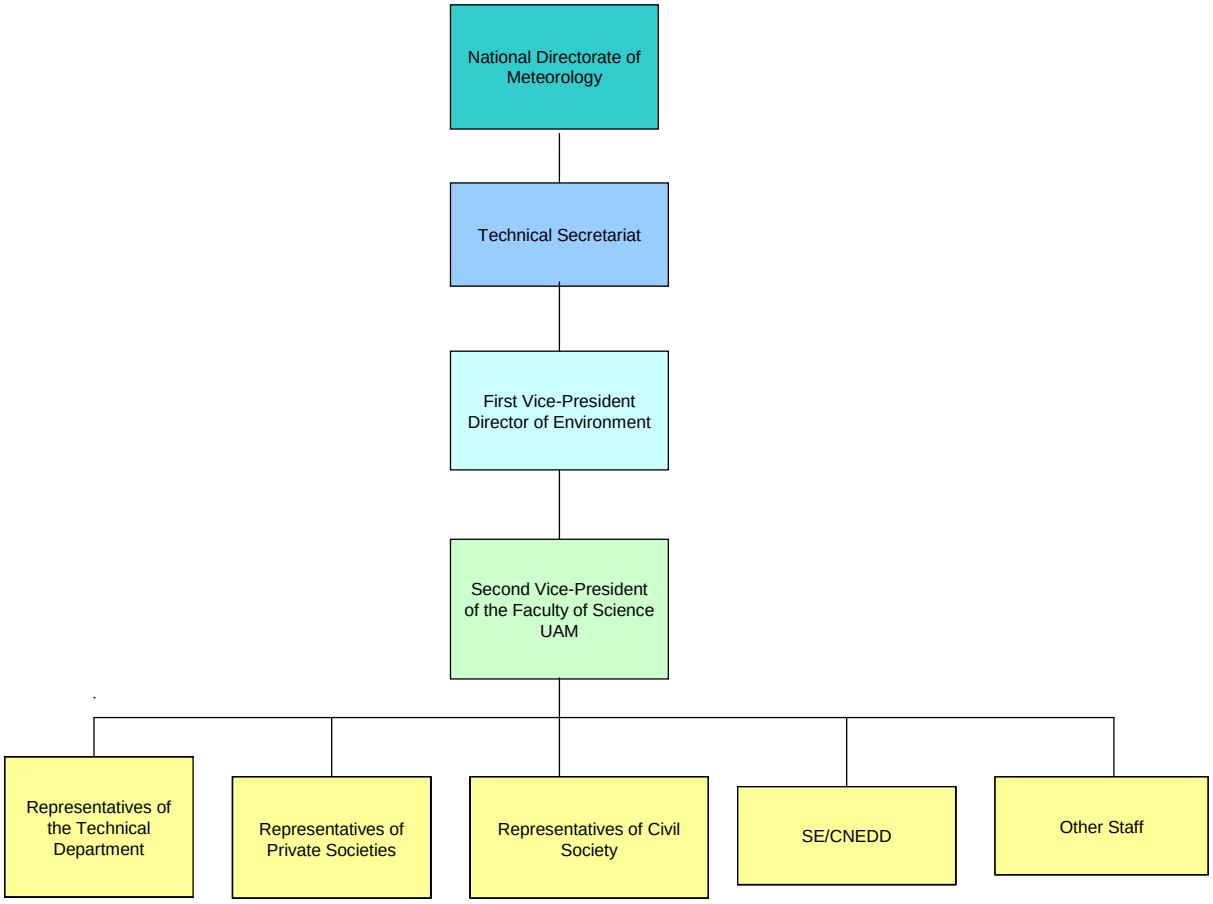


Figure 5: National Commission for Climate Change and Variability

197. **Technical Project Implementation Committee (TPIC).** The TPIC will comprise representatives from different implementing institutions under the supervision of the Executive Secretariat of SDR. These representatives may or may not be involved directly with implementation of the project, but will preferably have experience in the field of climate change and be members of the national technical commission on 'climate change and variability' in the National Climate Change Commission. The TPIC will provide technical guidance to ensure successful implementation of the project. It will confirm that project objectives are achievable; the activities technically sound, and will, together with the PSC, validate the annual working plan of the project. It will brief the Project Steering Committee and supervise the field implementation of the project. It will be a partner to all the implementation stakeholders and will determine the necessary resources required for implementation of field activities. It will ensure that there are links between all the different project components. It will meet once a quarter for ordinary sessions. And, when necessary some extraordinary meetings can be called. Furthermore, the TPIC will be in charge of (i) all general consultation, coordination and collaboration, (ii) decision-making concerning United Nations payments, (iii) all budgetary matters and (iv) following up on the progress of the project.

198. **Technical Inter-Ministerial Committee (TIMC).** The TIMC is a sub-committee of the TPIC, comprising representatives directly involved in project implementation. The TIMC will co-ordinate the project activities on a technical basis and will report to the PSC and TPIC on project implementation. They will ensure synergy and coordination with other activities operating in their respective ministries. The RDS ministries involved in project implementation will plan, co-ordinate and report on their assigned project activities. The PCU will work closely with the ministries in this regard. The local representatives of the implementing ministries will give technical backstopping to municipalities in planning, implementation, monitoring and reporting of the project activities.

199. UNDP-GEF will contribute to overall strategic planning and oversight of the project through their role on the Project Steering Committee, and will also collaborate directly with CNEDD in decisions on project activities and expenditures, such as subcontracting consultants. UNDP will provide relevant technical guidance, including adaptation methodologies and frameworks, best-practices, and help to disseminate project products though the ALM and other mechanisms, as appropriate. The UNDP country office will contribute to the work of the national team, including participating in national meetings, identifying local and international consultants, and facilitating collaboration with appropriate partners, such as national and international development agencies, representatives of the UNFCCC, the GEF national (operational and political) focal points and research institutes. The roles of key stakeholders within UNDP at the national, regional and global level will be outlined in the Delegation of Authority letter issued after CEO endorsement.

200. The proposed governance structure for the project and the division of responsibilities among the key institutions are represented in the figure in Section IV: Additional information, Part II.

UNDP as implementing agency for the project

201. In alignment with a request by the GON, the UNDP will be the implementing agency for the project: The proposed project is aligned with UNDP's comparative advantage in improving capacity building, providing technical support for policy formulation as well as expertise in project design and implementation in relevant areas such as sustainable land management and water governance. The project will contribute to meeting the objectives as set out in the UNDP Country Programme 2009 - 2013 for Niger (CPD 2009-2013), and will be implemented within that programme. UNDP will also draw on its experience of conducting almost all the NAPA process in the sub-region and on the technical assistance from the Drylands Development Centre, which specializes in assisting countries to fight poverty and encourage development in the drier parts of the world, as well as the Water Governance Facility (a joint UNDP-SIDA initiative which seeks to advance socially equitable, environmentally sustainable and economically efficient management of water resources). Through its network of technical staff, in addition to operational expertise in designing similar GEF Council approved projects in arid regions of Africa (Kenya, Mozambique, Zimbabwe and Ethiopia), UNDP is well positioned to assist Niger to design and implement the proposed project. During the course of implementation, coordination with relevant initiatives by UNDP's Bureau of Crisis Prevention and Recovery will also be explored. During the inception workshop, opportunities to benefit from available linkages to and technical services related to other UNDP/EEG-led initiatives such as the one on supporting countries with integrating climate change into development planning and programming, Africa Adaptation Programme (Government of Japan), Community Based Adaptation Programme (GEF funded), Territorial Project, Capacity Development/Investment and Financial Flows project, Poverty-Environment Initiative and others will also be made.

202. Among other comparative advantages that the UNDP has in the context of the project, the following stand out:

- The provision of flexible, effective, opportune technical assistance focused toward strengthening institutional capacities both at the national and local levels.
- A well-established capacity to mobilize resources for development at the national and local levels in Niger.
- Access to global information networks, experience and knowledge that can be used to strengthen the implementation of the project.
- Neutrality, credibility and social trust aimed at facilitating agreements and prevention and mediation of social conflicts. Given the number of government and institutions at the central and provincial level, as well as the local communities and other agencies to be involved, UNDP is well place to mediate in potential conflicts among these stakeholders.

PART IV: Monitoring and Evaluation Plan and Budget

203. Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures and will be provided by the project team and the UNDP Country Office (UNDP-CO) with support from UNDP/GEF. The Logical Framework Matrix in Section II provides performance and impact indicators for project implementation along with their corresponding means of verification. These will form the basis on which the project's Monitoring and Evaluation system will be built.

204. The following sections outline the principle components of the Monitoring and Evaluation Plan and indicative cost estimates related to M&E activities. The project's Monitoring and Evaluation Plan will be presented and finalized in the Project's Inception Report following a collective fine-tuning of indicators, means of verification, and the full definition of project staff M&E responsibilities.

Monitoring and Reporting

Project Inception Phase

205. A Project Inception Workshop will be organized with relevant government counterparts, co-financing partners, the UNDP-CO and UNDP-GEF.

206. A fundamental objective of this Inception Workshop (IW) will be to assist the project team to understand and take ownership of the project's goals and objectives, as well as finalize preparation of the project's first annual work plan on the basis of the project's log frame matrix. This will include reviewing the log frame (indicators, means of verification, assumptions), imparting additional detail as needed, and on the basis of this exercise, finalize the Annual Work Plan (AWP) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project.

207. Additionally, the purpose and objective of the IW will be to provide a detailed overview of UNDP-GEF reporting and monitoring and evaluation (M&E) requirements, with particular emphasis on the Annual Project Implementation Reviews (PIRs) and related documentation, the Annual Project Report (APR), Tripartite Review Meetings, as well as mid-term and final evaluations. Equally, the IW will provide an opportunity to inform the project team on UNDP project related budgetary planning, budget reviews, and mandatory budget rephrasing.

208. The IW will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines and conflict resolution mechanisms. The Terms of Reference (TOR) for project staff and decision-making structures will be discussed again, as needed, in order to clarify each party's responsibilities during the project's implementation phase.

Monitoring responsibilities and events

209. A detailed schedule of project review meetings will be developed by the Project Management Unit (PMU) in consultation with the National Steering Committee and incorporated in the Project Inception Report. Such a schedule will include: (i) tentative time frames for Tripartite Reviews, Management Support Group, and (ii) project related M&E activities.

210. Day to day monitoring of implementation progress will be the responsibility of the National Coordinator based on the AWP and its indicators. The National Coordinator will inform the UNDP-

CO and MoE of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion.

211. MoE will fine-tune the progress and performance/impact indicators of the project in consultation with the MSG at the IW. Specific targets for the first year implementation progress indicators together with their means of verification will be developed at this Workshop. These will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the AWP. The local implementing partners will also take part in the IW in which a common vision of overall project goals will be established. Targets and indicators for subsequent years will be defined annually as part of the internal evaluation and planning processes undertaken by the MoE and the MSG.

212. Measurement of impact indicators related to global benefits will occur according to the schedules defined in the IW and tentatively outlined in the indicative Impact Measurement Template. The measurement of these will be undertaken through subcontracts or retainers with relevant institutions to be determined during the IW or through specific studies that are to form part of the projects' activities or periodic sampling.

213. Periodic monitoring of implementation progress will be undertaken by the UNDP-CO through quarterly meetings with the National Coordinator, or more frequently as deemed necessary. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.

214. UNDP CO and the MoE, as appropriate, will conduct yearly visits to field sites, or more often based on an agreed upon schedule to be detailed in the projects' Inception Report /AWP to assess progress. Members of the National Steering Committee can also accompany such visits, as decided by the MSG. A Field Visit Report will be prepared by the CO and circulated no less than one month after the visit to the project team, all MSG members, and MoE.

215. *Annual Monitoring* will occur through the Tripartite Review (TPR). This is the highest policy-level meeting of the parties directly involved in the implementation of the project. The project will be subject to TPR at least once every year. The first such meeting will be held within the first twelve months of the start of full implementation. The National Coordinator will prepare reports that will be compiled into APR by the MoE at least two weeks prior to the TPR for review and comments.

216. The APR will be used as one of the basic documents for discussion in the TPR meeting. The CNRH will present the APR to the TPR, highlighting policy issues and recommendations for the decision of the TPR participants. The MoE also informs the participants of any agreement reached by stakeholders during the APR preparation on how to resolve operational issues. Separate reviews of each component may also be conducted if necessary.

Terminal Tripartite Review (TTR)

217. The TTR is held in the last month of operations. The MoE is responsible for preparing the Terminal Report and submitting it to UNDP and the GEF Secretariat. It shall be prepared in draft at least two months in advance of the TTR in order to allow review, and will serve as the basis for discussions in the TTR. The TTR considers the implementation of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental objective. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as a vehicle through which lessons learnt can be captured to feed into other projects under implementation of formulation.

218. The TPR has the authority to suspend disbursements if project performance benchmarks are not met. Benchmarks will be developed at the IW, based on delivery rates, and qualitative assessments of achievements of outputs.

219. MoE will be responsible for the preparation and submission of the following reports that form part of the monitoring process

Inception Report (IR)

220. A Project IR will be prepared immediately following the IW. It will include a detailed First Year/AWP divided in quarterly time-frames detailing the activities and progress indicators that will guide implementation during the first year of the project. This Work Plan would include the dates of specific field visits, support missions from the UNDP-CO or the MoE or consultants, as well as time-frames for meetings of the MSG. The Report will also include the detailed budget for the first full year of implementation, prepared on the basis of the AWP, and including any monitoring and evaluation requirements to effectively measure performance during the targeted 12 months time-frame.

221. The IR will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of project related partners. In addition, a section will be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may effect project implementation.

222. When finalized, the report will be circulated to project counterparts who will be given a period of one calendar month in which to respond with comments or queries.

Annual Project Report (APR)

223. The APR is a UNDP requirement. It is a self-assessment report by project management to UNDP and provides input to the TPR. An APR will be prepared on an annual basis prior to the TPR, to reflect progress achieved in meeting the project's AWP and assess performance of the project in contributing to intended outcomes through outputs and partnership work.

The format of the APR is flexible but should include the following:

- An analysis of project performance over the reporting period, including outputs produced and, where possible, information on the status of the outcome
- The constraints experienced in the progress towards results and the reasons for these
- The three (at most) major constraints to achievement of results
- AWP, CAE and other expenditure reports (ERP generated)
- Lessons learned
- Clear recommendations for future orientation in addressing key problems in lack of progress

Project Implementation Review (PIR)

224. The PIR is an annual monitoring process mandated by the GEF. It has become an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from ongoing projects. Once the project has been under implementation for a year, a Project Implementation Report must be completed by the MoE, in cooperation with National Coordinators. The PIR can be prepared any time during the year (July-June) and ideally prior to the TPR. The PIR should then be discussed in the TPR so that the result would be a PIR that has been agreed upon by all partners.

Quarterly Progress Reports

225. Short reports outlining main updates in project progress will be provided quarterly to the local UNDP CO and the MoE by National Consultants.

Periodic Thematic Reports

226. As and when called for by UNDP or the GEF Secretariat, MoE will prepare Specific Thematic Reports, focusing on specific issues or areas of activity. The request for a Thematic Report will be provided to the MoE in written form by UNDP and will clearly state the issue or activities that need to be reported on. These reports can be used as a form of lessons learnt exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered. UNDP is requested to minimize its requests for Thematic Reports, and when such are necessary will allow reasonable timeframes for their preparation by the project team.

Project Terminal Report

227. During the last three months of the project MoE will prepare the Project Terminal Report. This comprehensive report will summarize all activities, achievements and outputs of the Project, lessons learnt, objectives met or not achieved, structures and systems implemented, and will thus provide an assessment of the project's performance during its lifetime. It will place emphasis on the analysis of the water governance scheme adopted to manage water resources in the context of a changing climate, highlighting the potential contribution of such a scheme to national development in relevant areas. It will also provide recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's activities.

Technical Reports

228. Technical Reports are detailed documents covering specific areas of analysis or scientific specializations within the overall project. As part of the Inception Report, the project team will prepare a draft Reports List detailing the technical reports that are expected to be prepared on key areas of activity during the course of the Project, and tentative due dates. Where necessary this Reports List will be revised and updated, and included in subsequent APRs. One key technical report expected to be produced by the project in the first year is the synthesis document on cross-cutting issues including financial mechanisms, based on materials generated during the PPG phase. Elements of this report will be disseminated widely among key stakeholders involved in the project.

229. Technical Reports may also be prepared by external consultants and should be comprehensive, specialized analyses of clearly defined areas of research within the framework of the project and its sites. These technical reports will represent, as appropriate, the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national and international levels.

Project Publications

230. Project Publications will be a key method for disseminating the results and achievements of the Project. These publications should be scientific as well as popular texts on the activities and achievements of the Project. These publications can be based on Technical Reports, or may be summaries or compilations of a series of Technical Reports and other research. The project team will determine if any of the Technical Reports merit formal publication, and will also (in consultation with UNDP, the government and other relevant stakeholder groups) plan and produce these publications in a consistent and recognisable format. It is anticipated that at a minimum one major publication synthesizing key lessons from the project and experiences of the case sites will be produced in the last year of the project. Project resources will need to be defined and allocated for these activities as appropriate and in a manner commensurate with the project's budget. Other publications will include shorter policy briefs.

Independent Evaluation

231. The project will be subjected to at least two independent external evaluations as follows:

Mid-term Evaluation

232. An independent Mid-Term Evaluation will be undertaken at the end of the second year of implementation. The Mid-Term Evaluation will determine progress being made towards the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions, and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The ToR for this Mid-term evaluation will be prepared by MoE based on guidance from UNDP's Office of Evaluation.

Final Evaluation

233. An independent Final Evaluation will take place three months prior to the terminal tripartite review meeting, and will focus on the same issues as the mid-term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The ToR for this evaluation will be prepared by MoE based on guidance from UNDP's Office of Evaluation.

Learning and Knowledge Sharing

234. Results from the programme will be disseminated within and beyond the programme intervention zone through a number of existing information sharing networks, in particular, the ALM. The ALM lessons learned template will be adapted to be used by the project.

235. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Identifying and analyzing lessons learned is an on-going process, and the need to communicate such lessons as one of the project's central contributions is a requirement to be delivered not less frequently than once every 12 months. UNDP shall provide a format and assist the project team in categorizing, documenting and reporting on lessons learned. To this end a percentage of project resources will need to be allocated for these activities.

Indicative Monitoring and Evaluation Work Plan and Corresponding Budget

236. At the preparation IW, a detailed M&E plan will be developed and approved. This plan will specify arrangements for M&E of each of the indicators at the level of objectives, outcomes, and outputs listed in the logical framework matrix. The following table provides the outline of the M&E framework.

Table 6: Project Monitoring and Evaluation

Type of M&E activity	**Responsible Parties**	**Budget US$** *Excluding project team staff time*	**Time frame**
Inception Workshop	▪ Project Coordinator ▪ UNDP CO ▪ UNDP GEF	12, 000	Within first two months of project start up
Inception Report	▪ Project Team ▪ UNDP CO	8, 000	Immediately following Inception Workshop

Measurement of Means of Verification for Project Purpose Indicators	▪ National Coordinators will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members	21, 400	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	▪ Oversight by MoE ▪ Measurements by field officers and local IAs	31, 500	Annually prior to APR/PIR and to the definition of annual work plans
APR and PIR	▪ MoE ▪ UNDP-GEF	33, 000	Annually
TPR and TPR report	▪ Government Counterparts ▪ MoE ▪ Executing Agency	32, 500	Every year, upon receipt of APR
National Steering Committee Meetings	▪ MoE ▪ National Coordinators	50, 000	Following Project Inception Workshop and subsequently at least once a year
Periodic status reports	▪ MoE ▪ National Coordinators	14, 000	To be determined by Project team and UNDP CO
Technical reports	▪ MoE ▪ Hired consultants as needed	14, 000	To be determined by Project Team and UNDP-CO
Mid-term External Evaluation	▪ MoE ▪ National Coordinators ▪ External Consultants (i.e. evaluation team)	9, 000	At the mid-point of project implementation.
Final External Evaluation	▪ MoE ▪ National Coordinators ▪ External Consultants (i.e. evaluation team)	9, 000	At the end of project implementation
Terminal Report	▪ MoE ▪ National Coordinators ▪ External Consultant	7, 000	At least one month before the end of the project
Lessons learned	▪ MoE ▪ National Coordinators	56, 495	Yearly
Visits to field sites by independent consultants (UNDP staff travel costs to be charged to IA fees)	▪ UNDP CO ▪ MoE ▪ Government representatives	60, 000	Yearly
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		357, 895	

PART V: Legal Context

237. This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of Niger and the UNDP, signed by the parties in 1972. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

238. The UNDP Resident Representative in Niger is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

a) Revision of, or addition to, any of the annexes to the Project Document;
b) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;

c) Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility;
d) Inclusion of additional annexes and attachments only as set out here in this Project Document.

SECTION II: Strategic Results Framework and GEF

PART I: Strategic Results Framework (SRF, formerly GEF Logical Framework)

Table 7: Strategic Results Framework of the project

Project Strategy	Indicator*	Baseline value	Target and benchmarks	Sources of verification	Risks and Assumptions
Goal: To enhance the adaptive capacity to climate change in the agriculture and water sectors in Niger.					
Objective: To implement long-term adaptation measures that increase agricultural productivity, food security and water availability.	Number of long-term adaptation measures implemented that increase agricultural productivity, food security and water availability.	No long-term climate change adaptation measures implemented.	By the end of the project, at least 20 long-term adaptation measures that increase agricultural productivity, food security and water availability are implemented.	Revised plans. Surveys. End of project evaluation reports.	There is a political and public willingness to implement long-term adaptation measures.
Outcome 1: Resilience of food production systems and/or food insecure communities enhanced in the face of climate change.	Numbers of previously food insecure communities that become food secure.	Food production systems and food insecure communities exhibit low resilience to climate change and variability.	By the end of the project, at least 8 previously food insecure communities become food secure.	End of project evaluation reports.	Local stakeholders adopt the guidelines.
Output 1.1. Seeds of tried and tested drought-resilient crop varieties disseminated	1.1.1. Number of farmers using improved varieties due to project interventions. 1.2.2. Yield level comparatively higher than that of traditional varieties. 1.2.3. Increased surplus of production compared to that of traditional varieties. 1.2.4. Accessibility of seeds for producers. 1.2.5. Management committees (comprising 10 people, including 5 women) are	Currently, there are no farmers cultivating drought-adapted crops.	By the end of the project, a minimum of 500 farmers are cultivating drought-adapted crops. By the end of the project the yield level of the drought-resistant varieties is 20% greater than that of the traditional varieties. By the end of Year 2, at least 80 people, including 40 women, have been trained to form 8 management committees, with one committee at each vulnerable	Evaluation reports Field surveys. Inventory stock list of seedlings.	Relevant stakeholders adopt the guidelines.

Project Strategy	Indicator*	Baseline value	Target and benchmarks	Sources of verification	Risks and Assumptions
	established to facilitate the adoption of drought-resilient crops by the wider community.		site.		
Output 1.2. Farm trials of drought-resilient crop varieties (that are not tried and tested) undertaken.	1.2.1. Number of drought-resilient crop varieties that have undergone farm trials.	At present, drought-resilient crop species have not undergone farm trials.	By the end of Year 2, demonstration sites of at least 5 hectares have been implemented to test drought-resilient crop species, at each site.	Evaluation reports. Field Surveys.	Relevant stakeholders adopt the guidelines. Farm trials are undertaken correctly.
Output 1.3. Cereal banks constructed and managed.	1.3.1. Number of cereal banks rehabilitated. 1.3.2. Number of new cereal banks created and functional. 1.3.3. Number of management committees set up. 1.3.4. Number of people trained in the management committees. 1.3.5. Quantity of foodstuff available in the banks. 1.3.6. The capacity to replace bank stock. 1.3.7. The capacity of financial management.	At least 3 cereal banks require rehabilitation in the eight vulnerable sites. A 2006 survey documented the existence of 3 987 cereal banks. Cereal banks are mismanaged.	By the end of Year 3, all 3 cereal banks are rehabilitated. By the end of Year 4, at least 27 cereal banks have been created and are functional. At the end of Year 4, at least 7 management committees are set up and have capacity to manage finances and replace bank stocks. By the end of year 4, at least 70 people (including 35 women) are trained in the management committees. By the end of the project, cereal banks are 70% full.	Field Surveys. Evaluation reports. Training protocols.	Local stakeholders support the adoption of adaptation measures. Cereal banks are correctly managed by management committees.
Output 1.4. Fodder/feed banks constructed and managed.	1.4.1. Number of fodder banks created and functional. 1.4.2. Number of management committees set up. 1.4.3. Number of people trained in the management committees. 1.4.4. Quantity of	No fodder bank actually exist in the project identified sites	By the end of Year 4, at least 13 fodder banks have been created and are functional. At the end of Year 4, at least 2 management committees are set up and have capacity to manage finances and replace bank	Field Surveys. Evaluation reports. Training protocols	Local stakeholders support the adoption of adaptation measures. Fodder banks are correctly managed by management committees.

Project Strategy	Indicator*	Baseline value	Target and benchmarks	Sources of verification	Risks and Assumptions
	foodstuff available in the banks. 1.4.5. The capacity to replace bank stock. 1.4.6. The capacity of financial management.		stocks. By the end of Year 4, at least 20 people (including 10 women) are trained in the management committees. By the end of the project, fodder banks are 70% full.		
Output 1.5. Fertilizer/pesticide shops constructed and managed.	1.5.1. Number of fertilizer/pesticide shops created and functional. 1.5.2. Number of management committees set up. 1.5.3. Number of people trained in the management committees. 1.5.4. Quantity of fertilizer/pesticides available in the shops. 1.5.5. The capacity to replace shop stock. 1.4.6. The capacity of financial management.	No fertilizer/pesticide shops have been constructed.	By the end of Year 3, at least 3 shops have been created and are functional. By the end of Year 3, at least 3 management committees have been set up and have capacity to manage finances and replace shop stocks. By the end of Year 3, at least 30 people (including 15 women) are trained in the management committees. By the end of Year 3, fertilizer/pesticide shops are stocked to 70% capacity.	Field Surveys. Evaluation reports. Training protocols	Local stakeholders support the adoption of adaptation measures. Fertilizer/pesticide shops are correctly managed by management committees.
Output 1.6. Wells and drinking water supplies for both human and livestock use constructed.	1.6.1. Number of wells constructed. 1.6.2. Number of drinking water supply networks constructed. 1.6.3. Number of management committees established to manage the wells and DWS networks at each site.	Insufficient number of wells existing for the supply of water to the population and livestock. Existing drinking water supply networks are insufficient in number to supply water to the population and many require maintenance.	By the end of Year 4, at least 172 wells have been constructed. By the end of Year 4, a minimum of 7 drinking water supply networks have been constructed. By the end of Year 2, at least 70 people, including 35 women, are trained in the 7 management committees.	Field Surveys.	Local stakeholders support the adoption of adaptation measures.
Output 1.7. Area under irrigation at	1.7.1. Number of irrigation wells	Irrigation wells are currently	By the end of Year 3, at least 160	Field	Local stakeholders support the

Project Strategy	Indicator*	Baseline value	Target and benchmarks	Sources of verification	Risks and Assumptions
a village level expanded.	constructed. 1.7.2. Number of management committees established to manage the establishment and running of new irrigated lands at each site. 1.7.3. The extent of new irrigated land that is fenced by either wire or trees. 1.7.4. Number of firebreaks constructed. 1.7.5. Number of windbreaks constructed.	insufficient in number and many are unreliable. Irrigated plots are not fenced, and crops are raided by livestock. No firebreaks are erected and crops and forage are damaged by wildfires. No windbreaks are erected and crops are damaged by strong winds.	irrigation wells have been constructed. By the end of Year 2 at least 70 people, including 35 women, are trained in the 7 management committees. By the end of the project, at least 155 ha of new irrigated land are fenced by wire and at least 15 ha of new irrigated land are fenced using trees. By the end of Year 2, firebreaks have been constructed at least 3 vulnerable sites. By the end of Year 2, windbreaks have been constructed at least 3 vulnerable sites.	Surveys.	adoption of adaptation measures.
Output 1.8. Soils in degraded agricultural landscapes stabilised by using soil and water conservation measures (CES/DRS), including banquettes.	1.8.1. Number of banquettes constructed in agricultural landscapes. 1.8.2. Number of banquettes in which crops have been sown. 1.8.3. Increased agricultural productivity in landscapes containing banquettes compared to that in landscapes lacking banquettes. 1.8.5. Number of management committees established to manage the establishment and maintenance of banquettes at each site.	No banquettes constructed in the agricultural landscape.	By the end of the project banquettes covering at least 1602 ha have been constructed. By the end of the project crops have been sown in 100% of agricultural banquettes. By the end of the project, surplus production in landscapes with agricultural banquettes is at least 25% greater than that in landscapes lacking banquettes. By the end of Year 2, at least 20 people, including 10 women, are trained in the 2 management committees.	Field Surveys.	Local stakeholders support the adoption of adaptation measures.

Project Strategy	Indicator*	Baseline value	Target and benchmarks	Sources of verification	Risks and Assumptions
Output 1.9. Soils in pastoral landscapes stabilised using soil and water conservation measures (CES/DRS), including banquettes, planting trees and sowing seeds of drought-resilient fodder species.	1.9.1. Number of banquettes constructed, trees planted and seeds of drought-resilient fodder species sown in pastoral landscapes. 1.9.2. Number of management committees established to manage the establishment and maintenance of banquettes, to oversee the planting of trees and the sowing of drought-resilient fodder species at each site.	No banquettes constructed, trees planted or seeds sown in the pastoral landscapes.	By the end of the project banquettes covering at least 4895 ha have been constructed, at least 250 trees per hectare planted and at least 100 bags containing seeds of drought-resilient fodder species have been sown per hectare in pastoral landscapes. By the end of Year 2, at least 50 people, including 25 women, are trained in the 5 management committees.	Field Surveys.	Local stakeholders support the adoption of adaptation measures.
Output 1.10. Dunes around micro-basins stabilised.	1.10.1. Number of dunes that have been stabilised by planting drought-resilient trees, shrubs and grasses in dune landscapes. 1.10.2. Number of management committees established to monitor agricultural production and sand movement in dune landscapes.	Active dune stabilisation around water basins has not been undertaken.	By the end of the project, at least 470 hectares of dunes have been stabilised by planting drought-resilient trees, shrubs and grasses. By the end of Year 2, at least 30 people, including 15 women, are trained in the 3 management committees.	Field Surveys.	Local stakeholders support the adoption of adaptation measures.
Output 1.11. Gabions and weirs constructed where loss of river banks to floods is threatening village infrastructure and agricultural land.	1.11.1. Number of gabions and weirs constructed. 1.11.2. Number of Water Basin Management Schemes implemented. 1.11.3. Number of river banks where indigenous vegetation has been restored in order to stabilise banks. 1.11.4. Number of management committees trained to oversee and monitor water basin management	Gabions and weirs not constructed where loss of river banks to floods is threatening village infrastructure and agricultural land. Water Basin Management Schemes have not been implemented. Indigenous vegetation has not been actively restored along river banks.	By the end of Year 3, a minimum of 500 m of river bank at each of 4 sites have been stabilised by the construction of gabions and weirs. By the end of the project, Water Basin Management Schemes have been implemented in at least 4 vulnerable sites. By the end of Year 3, indigenous vegetation has been restored	Field Surveys. Evaluation Reports.	Local stakeholders support the adoption of adaptation measures. Relevant experts and materials are available.

Project Strategy	Indicator*	Baseline value	Target and benchmarks	Sources of verification	Risks and Assumptions
	and river stabilisation efforts.		along at least 5 km of vulnerable river banks. By the end of Year 2, at least 50 people, including 25 women, are trained in the 5 management committees.		
<u>Outcome 2:</u> Institutional capacity of the agricultural and water sector enhanced, including information and extension services to respond to climate change, including variability.	Number of institutional agreements to improve climate information networks.	Climate information systems are poorly managed and information is inadequately disseminated.	By the end of the project, at least 4 institutional agreements are in place to improve climate information networks.	Reports/Field Surveys.	Local stakeholders support the adoption of adaptation measures. There is political stability in policies and strategies that promote resilient livelihoods and sustainability of agricultural production.
Output 2.1. Institutional capacity to support climate risk management in pastoral and agricultural land management at the national, district and village level developed.	2.1.1. Number of NMB staff trained to provide short- and medium-term forecasts from downscaling of available data in a format that is suitable for subsistence farmers. 2.1.2. Number of farmers who make use of meteorological forecast information. 2.1.3. Number of computers provided to the NMB for downscaling calculations. 2.1.4. Number of radio transmitters constructed in the necessary vulnerable sites. 2.1.5. The Niger Rural Code has been revised in terms of adapting to climate change and using rangelands in a	Forecast information is not disseminated. No farmers currently make use of meteorological forecast information. Climate data is not downscaled. Radio is not used to disseminate seasonal forecast data at present. At present the Niger Rural Code contains no reference to climate change adaptation and rangelands are made use of in an unsustainable manner. At present, pastoralism strategies do not include measures to adapt to climate change. At present the Commune	By the end of the project at least 15 NMB staff has been trained to provide forecast information. By the end of the project, at least 50% of farmers making use of longer term meteorological forecast information. By the end of Year 1, 10 computers have been provided to the NMB. By the end of Year 2, at least 8 radio transmitters have been constructed in the necessary vulnerable sites. By the end of the project, the Niger Rural Code has been revised accordingly. By the end of the project, at least 5 local strategies to	Evaluation reports. Field Surveys. Training reports. Policy review report.	There is political stability in policies and strategies that promote resilient livelihoods and sustainability of protective ecosystems. Local stakeholders support the adoption of adaptation measures. Government remains stable and ensuring climate-resilient land use policies remain a priority. Capacity to undertake policy review exists. Policy stakeholders remain supportive of revising policies to support climate resilience at the community level and are willing to receive input from local levels.

Project Strategy	Indicator*	Baseline value	Target and benchmarks	Sources of verification	Risks and Assumptions
	sustainable manner. 2.1.6. Number of local strategies developed for pastoralists, enabling them to adapt to climate change. 2.1.7. Number of staff in government departments trained to ensure that data from demonstration projects in outcome 1 are collected, analysed and published. 2.1.8. The Commune Development Strategies for each site have been revised.	Development Strategies do not take into account climate change adaptation.	enable pastoralists to adapt to climate change have been developed. By the end of the project, at least 500 staff in government has been trained on the new strategies and the revision to the Niger Rural Code. By the end of the project, the Commune Development Strategies for each site have been revised to include climate change adaptation.		
Output 2.2. Institutional capacity to incorporate climate change risks into water supply and management developed.	2.2.1. Number of staff trained on incorporation of climate risks in the agriculture and water sectors into the relevant plans. 2.2.2. Revision of IWRM Plan.	Only specialized staff in the MoE has knowledge on adaptation measures. The IWRM Plan does not include climate change risks.	By the end of the project, at least 500 staff is trained on the incorporation of climate risks (in the agriculture and water sectors) into relevant plans. By the end of the project, the IWRM Plan incorporates climate change risks.	Training Reports.	There is political stability in policies and strategies that promote resilient livelihoods and sustainability of agricultural productivity.
Output 2.3. Institutional capacity to create alternative climate-resilient livelihoods for farmers and pastoralists developed.	2.3.1. Number of savings and credit institutions created in Niger. 2.3.2. Number of management committees established and trained for credit allocation at each site. 2.3.3. Number of sites where facilities have been developed for local entrepreneurial activities. 2.3.4. Number of public awareness campaigns carried	Currently, savings and credit institutions do not exist at the vulnerable sites. Facilities are not present at sites to support local entrepreneurial activities. Climate change risks and adaptation measures are currently not disseminated to the local community. At present climate change is not a	By the end of Year 2, at least 8 savings and credit institutions have been created. By the end of Year 2, at least 80 people, including 40 women, are trained in management committees. By the end of Year 3, at least 8 facilities have been developed. By the end of the project, at least 8 public awareness campaigns (one at	Training Reports. Project progress reports, including reports on public awareness campaigns.	Local business leaders, support the development of entrepreneurial enterprises. Local teachers and academics support the inclusion of climate change into their teaching curricula.

Project Strategy	Indicator*	Baseline value	Target and benchmarks	Sources of verification	Risks and Assumptions
	out concerning climate change risks and adaptation. 2.3.5. Number of school children trained in climate change risks and adaptation. 2.3.6. Climate change risks and adaptation are included in the university courses.	part of the school or university curriculum.	each site) have been carried out. By the end of the project, at least 100 teachers have been trained in climate change risks and adaptation. By the end of the project, at least 10000 school children have been trained in climate change risks and adaptation. By the end of the project, climate change risks and adaptation are a part of the environmental sciences course at the Niamey University.		
<u>Outcome 3.</u> Lessons learned and knowledge management component established.	Number of proposals, papers, and other documents that incorporate learning from the project.	Development projects currently do not systematically benefit from learning practices and project lessons on community-based adaptation.	At the time of project completion, at least 4 proposed or ongoing projects (including decision-making, any agricultural or pastoralism activity or construction project etc) draw on lessons and knowledge generated through the project.	ALM platform Proposals, papers, and other documents.	ALM is operationally effective to document best practices from the project.
Output 3.1. Knowledge and lessons learned to support implementation of adaptation measures compiled and disseminated.	3.1.1. Number of lessons learned systematized. 3.1.2. Number of lessons included in the ALM. 3.1.3. A project website, including a project database and all reports has been created. 3.1.4. Draft documents are prepared containing information to guide future GEF and MoE support	No lessons learned compiled. No lessons included in the ALM. No specific website targeting climate change adaptation in Niger exists.	At the time of project completion, at least 20 examples of lessons learned will have been compiled and disseminated. At the time of project completion at least 20 examples of best practise generated through the project will be accessible through the ALM. Within 6 months	Reports. ALM platform. Project progress reports. Website address and site. Workshop proceedings.	Local stakeholders implement adaptation measures on the ground. The ALM is operational to facilitate learning All stakeholders support the development of the website. Other regions and countries believe experiences from the project are applicable to their

Project Strategy	Indicator*	Baseline value	Target and benchmarks	Sources of verification	Risks and Assumptions
	for interventions on adaptation to climate change, including variability. 3.1.5. Number of briefing papers documenting the lessons learned developed and published in peer-reviewed journals. 3.1.6. Number of regional and national workshops conducted for dissemination of project lessons. 3.1.7. Videos, booklets and pamphlets are being developed for policy makers, the public and school children. 3.1.8. Radio broadcasts disseminating lessons to rural farmers have been developed.		of the start of implementation, a website accessible through the ALM will be created. At the time of project completion, draft documents will be prepared to guide future GEF and MoE support for interventions on adaptation to climate change including variability. By the end of the project, at least one briefing paper has been developed and published in a peer-review journal. By the end of the project at least 8 regional and 1 national workshop have been conducted. By the end of the project, videos, booklets and pamphlets are being distributed to all policy makers, made readily available for the general public and have been distributed to all schools in the eight sites. By the end of the project, the radio transmitters are readily used to disseminate project lessons to rural farmers.		situations. Policy makers, community members and school children continue to be willing to learn, disseminate, and use information in videos, pamphlets and booklets.

PART II: Additional Cost Analysis

Project Background

239. The proposed project will focus on implementing long-term adaptation measures that will increase the resilience of the two most vulnerable sectors, agriculture and water (as identified by the Niger NAPA), to anticipated climate change impacts, and that consequently conforms to the LDCF criteria for GEF climate adaptation projects. The LDCF, initiated at COP-8, was created with the objective of funding urgent and immediate adaptation needs in LDCs (as identified in the NAPAs).

Additional Cost Assessment

Baseline

240. Development in Niger is constrained by extreme poverty. Factors exacerbating this poverty include malnutrition, high levels of child mortality, limited primary school education opportunities, and limited access to technology, disease pandemics, ecosystem degradation and regional conflicts. Food security and water availability are likely to be severely compromised by rising temperatures and greater variability in rainfall. Across Niger agricultural producers are operating with limited resources in fragile environments sensitive to even minor shifts in temperature and rainfall patterns. The livelihoods of rural farmers are particularly precarious because of isolation, small farm sizes, lack of secure land tenure, lack of access to technology, lack of access to electricity and fluctuations in global commodity prices and farm inputs. Furthermore, climate information and vulnerability assessments are severely restricted because of a shortage of climate data and very few meteorological stations.

241. The ability of the agricultural sector in Niger to cope with increases in temperature and loss in agricultural productivity is negligible given minimal infrastructure as result of poor investment in sector – only 2% of the national budget in this sector, poor financial resources, and pervasive soil erosion. Other non-climatic drivers leading to reduced productivity in the agricultural sector include: poor farming practices such as overstocking with livestock and ploughing of erodible soils; poor road maintenance and therefore difficulties in getting agricultural produce to market; and increasing rural populations with a concomitant expansion of agriculture into marginal landscapes. Furthermore, only some 10 % of the 27 000 ha of land suitable for irrigation is currently irrigated in Niger[35], leaving Nigerien farmers particularly vulnerable to rainfall fluctuations and increased evapotranspiration. Without adaptation measures the risk of famine and social collapse particularly in rural areas will increase. Rural communities already live near a famine threshold. Unless adaptation measures are put in place, climate change is likely to result in more frequent crossing of that threshold.

242. Another contributing factor to the agricultural productivity crisis is that the Niger population has grown rapidly in the past decade, and continues to grow at a rate of 3.3%. This excessive population growth has lead to an increase in livestock numbers in pastoral areas[36] and expansion of intensive agriculture into marginal landscapes, resulting in a contribution to the negative spiral of soil erosion and loss of agricultural productivity.

243. Many rural communities in Niger obtain their water from natural ponds or lakes. These water sources are replenished by surface flow and seepage of groundwater. An increase in the frequency of droughts as a consequence of climate change has already resulted in the desiccation of numerous ponds, a process that is likely to intensify[37]. The socio-economic effects arising from the loss of these ponds are disastrous and their reduction has resulted in a vastly reduced quality of life for many people. Woman and children, for example, frequently have to walk for an entire day to collect water. The distances to be walked to collect water in the future are likely to increase as climate change effects continue to manifest. The time required to collect water by these vulnerable groups, also has a

[35] Email communication with Garba Radji, Deputy Director of Water Resources in the Ministry of Water, Environment and Combating Desertification, 2 October 2006.
[36] Over the period 1990 to 2002, the number of cattle in Niger increased from 1.7 to 3.5 million and the number of goats from 5 to 9 million. Source: Rural Development Strategy of Niger, 2003.
[37] Niger National Adaptation Programme of Action, August 2006

negative economic effect in that these water bearers are unable to contribute to agricultural productivity.

244. Although the Niger government is actively involved in stimulating the rural economy, supplying water to rural populations, restoring degraded land and increasing agricultural productivity, at present, climate change considerations have not been incorporated into this planning. The behavioural changes that Nigeriens are presently undertaking in order to cope with climate change have not been studied. However, information obtained during the NAPA process suggests that activities such as migration to cities and towns, casual labour, harvesting of edible or medicinal plants in savannas and woodlands, and sale of crop residues are an adaptation response to climate change. These activities are undertaken on an ad hoc basis. A more co-ordinated approach to adaptation is required in order to ensure sustainability of adaptation activities.

Additional Cost Reasoning

245. Climate change has already contributed to both an agriculture/food security and water resources crises in Niger (as reported in the INC and NAPA). Predicted climate change effects will further aggravate this situation. The biggest impact of climate change being observed in Niger is an increase in the frequency of droughts, resulting in a decrease in agricultural production, a concomitant increase in grazing pressure on pastoral ecosystems, and consequently soil erosion on a large scale. There is a feedback effect whereby climate change exacerbates loss of soil which in turn further reduces agricultural productivity. In addition, predicted increases in temperature will lead to considerably greater rates of evapotranspiration, which will reduce the availability of water for plant growth as well as human consumption. The net effect will be reduced agricultural productivity[38] and fewer sources of potable water for rural communities. Furthermore, the recharge of surface and ground water resources will be reduced as a consequence of the increase in drought frequency and warmer temperatures, thus further impacting water availability for rural communities.

246. As one of the world's poorest countries with an extremely hot and dry climate, Niger is particularly susceptible to the predicted impacts of climate change, predominately in the water and agriculture sectors. For this reason, it is imperative that immediate action concerning adaptation measures is undertaken to enhance the resilience of these vulnerable sectors and, concurrently, the communities relying on them, in the face of climate change. Adaptation measures at the local level are required to demonstrate the benefits of adaptation and to catalyse the adoption of such measures. These measures should increase water availability, agricultural productivity and income generation for rural communities. In addition, adaptation to climate change needs to be incorporated into government planning from the local to national level in order to co-ordinate interventions in a systematic and cost-effective manner. This requires revision of policies such as the Niger Rural Code, the IWRM Plan, and Commune Development Strategies.

[38] Kurukulasuriya, P. et al. 2006. Will African Agriculture Survive Climate Change? The World Bank Economic Review, August 23

Summary of Adaptation Benefits and Costs

Table 8: Cost-benefit analysis

Cost/Benefit	Baseline (B)	Alternative (A) (i.e. co-financing)	Additionality (A-B) (i.e. GEF contribution)
BENEFITS			
National Benefits	Economic and social development objectives are achieved through baseline policies and programmes, but these are not sustainable due to the threats posed by future, long-term climate change including variability.	Economic and social development objectives are achieved through modified policies and programmes that account for the need to adapt to future, long-term climate change including variability, and which are therefore sustainable.	
COSTS			
<u>Outcome 1:</u> Resilience of food production systems and/or food insecure communities enhanced in the face of climate change.	The government of Niger and several donor organizations are currently implementing a number of baseline development activities in the agriculture sector. Special Programme of the President implements water harvesting techniques such as 'Zai'[39] in landscapes used for crop cultivation in all regions of Niger The GTZ-funded project, LUCOP, funds the implementation of 'Zai' and other water harvesting measures in cultivated landscapes. Food banks, another method of increasing food supply during droughts and during dry season months, are constructed by various stakeholders such as the Food Crisis Management Body. National Meteorological Department provides seasonal forecasts for Niger although there are limitations in the use of the information in planning	Current interventions to support the agriculture sector do not take risks of climate change, including variability, into account. The GEF intervention, supported by the LDCF, will meet the additional cost of interventions that are necessary to adapt. (Figures below exclude programme management and M&E costs)	

[39] 'Zai' entails digging holes (0.5 m diameter) at intervals of 1-2 m, and filling these holes with a mixture of compost, manure and topsoil. Rainwater runs off the bare soil surface between the holes and ultimately drains into them. In this way, each 'Zai' hole becomes a biological hotspot, with a greater soil-water and nutrient content than the surrounding soil. Crops (e.g. millet, sorghum and maize) are sown in the 'Zai' holes and their productivity is greatly increased relative to plants sown outside of these holes.

Cost/Benefit	Baseline (B)	Alternative (A) (i.e. co-financing)	Additionality (A-B) (i.e. GEF contribution)
	processes to address climate change risks. **Co-financing:** **SPNRP $4,000,000** **MIN. AG. $ 450,000** **ITALY $2,040,000** **MIN. LS. $3,100,000** **TOTAL: $9,590,000**	**Alternative:** **TOTAL: $11,778,263**	**Additionality:** **GEF: $2,188,263** **TOTAL: $2,188,263**
<u>Outcome 2:</u> **Institutional capacity of the agriculture sector enhanced, including information and extension services to respond to climate change, including variability.**	The National Meteorological Department generates seasonal weather forecasts (3-4 month forecasts) that predict the amount of rainfall in the wet season. The information is sent to various government departments, but is not adequately delivered to, or used by, rural farmers. These forecasts have been demonstrated to be reliable for use in agricultural planning processes in many parts of the world, but the use in rural areas in Niger as a planning tool is marginal. **Co-financing:** **ITALY $360,000** **MIN. LS. $624,000** **TOTAL: $984,000**	Implement local demonstrations to increase capacity to deal with climate change, including variability, in the design and management of crop production and water management systems. It will support the dissemination of climate change, including variability, relevant forecast materials to local communities. The project will also support the incorporation of adaptation to climate change, including variability, issues into provincial and local development and risk management plans. (Figures below exclude programme management and M&E costs) **Alternative:** **TOTAL: $2,060,842**	**Additionality:** **GEF: $956,842** **UNDP: $120,000** **TOTAL: $1,076,842**
<u>Outcome 3:</u> **Lessons learned and knowledge management component established.**	No lessons available at present time.	A comprehensive learning component is important so that LDCs can learn from the experiences of each other, as well as for disseminating lessons nationally. Linkages will be made to UNDP-GEF's Adaptation Learning Mechanism to ensure that lessons from this project will reach a broader audience including other IAs, donors and the GEFSEC who are likely to be engaged in similar initiatives in other countries	

Cost/Benefit	Baseline (B)	Alternative (A) (i.e. co-financing)	Additionality (A-B) (i.e. GEF contribution)
	Co-financing: **ITALY $100,000** **MIN. LS. $276,000** **TOTAL: $376,000**	(Figures below exclude programme management and M&E costs) **Alternative:** **TOTAL: $478,000**	**Additionality:** **GEF: $22,000** **UNDP: $80,000** **TOTAL: $102,000**
Others: PMU, Program Implementation Technical Support Team, and Indicative Monitoring	**Co-financing:** **$0**	**Alternative:** **TOTAL: $532,895**	**Additionality:** **GEF: $332,895** **CNEDD $200,000** **TOTAL: $532,895**
Total Costs	**Co-financing (excluding UNDP Niger and CNEDD):** **$10,950,000**	**Alternative:** **$14,850,000**	**Additionality:** **$3,900,000**

Table 9: UNDP/GEF Niger Co-Financing

Co-financing programmes and projects descriptions	Amount FCFA	Amount USD
Fonds Italie – CILSS –LCD 6 RPS	1 250 000 000	2 500 000
Ministère de l'Elevage et des Industries Animales (Gouvernement du Niger et partenaires dans le cadre des programmes de la SDR)	2 000 000 000	4 000 000
Ministère de Développement Agricole (Gouvernement du Niger)	225 000 000	450 000
Ministère de l'Environnement et de la Lutte Contre la Désertification/Programme Spécial du Président de la République	2 000 000 000	4 000 000
UNDP : Support to Niger in area of adaptation and climate change	100 000 000	200 000
CNEDD	100 000 000	200 000
TOTAL	**5 675 000 000**	**11 135 000**

SECTION III: Total Budget and Work plan

247. The financing instrument for the GEF-related funding component will be the LDCF. The proposed total project cost is US $15,320,000, comprising the following components: $10,950,000 (co-financing of Niger government and Italy/CILSS); $200,000 (co-financing UNDP Niger); $200,000 (co-financing CNEDD); $3,500,000 (GEF/LDCF); $100,000 (project preparation GEF), $20,000 (co-financing project preparation CNEDD); and $350,000 (UNDP Agency fee).

248. The Government of Niger has been pro-active in its support of this LDCF project. Subsequent to the approval of the PIF, the government pledged its further commitment to the project by increasing

its co-financing contribution from USD$ 4,050,000 to USD$ 8,7000,000). This increase in co-financing has come about because of the UNDP Country Office engagement with the government and the recognition by the government that climate change risk management and adaptation are of critical importance for the long-term stability of Niger. The government also recognizes that the investment required in climate change adaptation is likely to exceed hundreds of millions of dollars in the long term and that the LDCF project is likely to be a catalyst to generate the required investment.

249. The Government of Niger has also noted that successful demonstration projects within the LDCF project will provide a case for private sector investment and will contribute to achieving the National Development objectives as stipulated by the Rural Development Strategy. The ministries responsible for rural development have consequently decided to align there interventions with this LDCF project and other NAPA interventions.

250. During the preparation of the PPG, the National Consultants reported new findings of a deepening of rural poverty in Niger and a reduction of the agricultural contribution per capita to the Gross Domestic Product over the past decade. A pertinent example of the effects of this reduction in agricultural productivity is the reduction of milk production from 107 litres of milk per person per year to 30 litres per person per year. This decreased productivity per capita is likely to be a function of population growth but also climate change. Recent droughts in Niger have, for example, resulted in a decrease of up to 50% of livestock numbers.

251. Given the considerable increase in co-financing support of the Niger government, the magnitude of the climate change adaptation challenge facing Niger, and the new findings of the National Consultants showing deepening rural poverty linked to climate change in Niger, the GEF grant request has increased from $2,000,000 to $3,500,000. It is proposed that the additional funding be used to:

- train teachers and develop a climate change curriculum for schools at the project sites, in order to educate children on the likely effects of climate change and the appropriate adaptation activities for individuals as well as the country as a whole.
- increase the capacity of the National Meteorological Department to provide seasonal forecasting to farmers through downscaling of climate forecast data.
- support the coordination activities of national institutions and, in particular, the National Technical Commission for Vulnerability and Climate Change to continue to mobilize resources for the implementation of the NAPA priority interventions.
- increase the productivity of agricultural landscapes through soil and water conservation measures (i.e. banquettes and dune stabilisation)

Table 10: Total Budget and Work plan

Award ID	00058080
Project ID	00072003
Award Title:	**3826 CC FSP NAPA follow up project in Niger**
Business Unit:	**NER10**
Project Title:	**Implementing NAPA priority interventions to build resilience and adaptive capacity of the agriculture sector to climate change in Niger**
Implementing Partner	**Niger Government**
Lead Coordinating Agency	**CNEDD (001423)**
Other Implementing Partners	**RDS, Ministries of Agriculture, Environment and Desertification Control, Animal Resources and Livestock Industries, Hydraulics, Finance and Economy, 8 municipalities of the project area, National Institute of Agronomic Research, ICRISAT, Agrhymet, University of Niamey, etc.**

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
<u>Outcome 1:</u> Resilience of food production systems and/or food insecure communities enhanced in the face of climate change.	CNEDD/Min. Agric. Dev./UNDP		Min. Agric. Dev.	72100	Contractual Services – Companies (Seed Dissemination)	112,500	112,500	112,500	112,500	**450,000**	1.1
	CNEDD/UNDP		GEF	72100	Contractual Services – Companies (Seed Dissemination)	69,500	69,500	69,500	69,500	**278,000**	1.1
	CNEDD/UNDP		GEF	72100	Contractual Services – Companies (Undertake Farm Trials of Drought-Resilient Crop Species)	140,000	140,000	140,000	140,000	**560,000**	1.2

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72100	Contractual Services – Companies (Construction of Cereal Banks)	100,000	100,000	100,000	100,000	**400,000**	1.3
	CNEDD/UNDP		ITALIE – CILSS Project	72100	Contractual Services – Companies (Strengthening and Rehabilitation of Cereal Banks)	23,000	23,000	23,000		**69,000**	1.3
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72100	Contractual Services – Companies (Construction of Fodder Banks)	50,500	50,500	50,500	50,500	**202,000**	1.4
	CNEDD/UNDP		ITALIE – CILSS - project	72100	Contractual Services – Companies (Construction of Fertilizer/Pesticide Shops)	8,500	8,500	8,500	8,500	**34,000**	1.5
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72100	Contractual Services – Companies (Construction of Wells for Drinking and Irrigation, Including Pump Costs)	113,600	113,600	113,600	113,600	**454,400**	1.6
	CNEDD/UNDP		ITALIE – CILSS - project	72100	Contractual Services – Companies (Establishment of Drinking Water Supply Networks)	161,250	161,250	161,250	161,250	**645,000**	1.6
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72100	Contractual Services – Companies (Establishment of a Drinking Water Supply Networks)	160,900	160,900	160,900	160,900	**643,600**	1.6

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
	CNEDD/UNDP		ITALIE - CILSS	72100	Contractual Services – Companies (Expansion of the Area Under Irrigation at a Village Level)	129,726	127,000	127,000	127,000	**510,726**	1.7
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72100	Contractual Services – Companies (Expansion of the Area Under Irrigation at a Village Level)	50,000	50,000	50,000	50,000	**200,000**	1.7
	CNEDD/PSPR		PSPR	72100	Contractual Services – Companies (Provision of Fencing Materials and Construction of Wire Fences)	691,310	691,310	691,310	691,310	**2,765,240**	1.7
	CNEDD/PSPR		PSPR	72100	Contractual Services – Companies (Planting of Tree "Fences")	16,930	16,930			**33,860**	1.7
	CNEDD/UNDP		ITALIE - CILSS	72100	Contractual Services – Companies (Construction and Maintenance of Firebreaks)	74,887	74,887			**149,774**	1.7
	CNEDD/PSPR		PSPR	72100	Contractual Services – Companies (Construction and Maintenance of Windbreaks)	29,300	29,300			**58,600**	1.7
	CNEDD/PSPR		PSPR	72100	Contractual Services – Companies (Construction of	41,000	40,000	40,000	40,000	**161,000**	1.8

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
					Banquettes for Agriculture)						
	CNEDD/UNDP		ITALIE - CILSS	72100	Contractual Services – Companies (Construction of Banquettes for Agriculture)	100,000	100,000	100,000	100,000	**400,000**	1.8
	CNEDD/PSPR		PSPR	72100	Contractual Services – Companies (Construction of Banquettes for Forage)	100,000	100,000	100,000	100,000	**400,000**	1.9
	CNEDD/UNDP		GEF	72100	Contractual Services – Companies (Construction of Banquettes for Forage)	100,000	250,000	203,263	200,000	**753,263**	1.9
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72100	Contractual Services – Companies (Construction of Banquettes for Forage)	95,000	125,000	125,000	115,000	**460,000**	1.9
	CNEDD/PSPR		PSPR	72100	Contractual Services – Companies (Forage Seed Spreading)	25,000	25,000	25,000	25,000	**100,000**	1.9
	CNEDD/PSPR		PSPR	72100	Contractual Services – Companies (Sand Dune Stabilisation)	100,000	100,000	100,000	100,000	**400,000**	1.10
	CNEDD/UNDP		GEF	72100	Contractual Services – Companies (Construction of Gabions and Weirs)	50,000	50,000	50,000	50,000	**200,000**	1.11
	CNEDD/UNDP		ITALIE	72100	Contractual Services	57,875	57,875	57,875	57,875	**231,500**	1.11

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
			- CILSS		– Companies (Construction of Gabions and Weirs)						
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72100	Contractual Services – Companies (Water Basin Management)	185,000	185,000	185,000	185,000	**740,000**	1.11
	CNEDD/PSPR		PSPR	72100	Contractual Services – Companies (Clearing of Invasive Riverine Plants)	20,325	20,325	20,325	20,325	**81,300**	1.11
	CNEDD/UNDP		GEF	72100	Contractual Services – Companies (Training and Establishment of Management Committees for Land Use Activities in Outcome 1[1]	70,000	70,000	70,000	70,000	**280,000**	1.12
	CNEDD/UNDP		GEF	71300	Consultancy Services – Individual (M&E Expert)	15,000	18,000	18,000	18,000	**69,000**	1.13
	CNEDD/UNDP		GEF	71600	Duty Travel and Sundry (PMU Staff, Project-Related Government Staff)	12,000	12,000	12,000	12,000	**48,000**	1.14
Sub Total GEF						**456,500**	**609,500**	**562,763**	**559,500**	**2,188,263**	
Sub Total PSPR						**1,023,865**	**1,022,865**	**976,635**	**976,635**	**4,000,000**	
Sub Total ITALIE - CILSS						**555,238**	**552,512**	**477,625**	**454,625**	**2,040,000**	
Sub Total						**755,000**	**785,000**	**785,000**	**775,000**	**3,100,000**	

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
Min. Anim. Res.											
Sub Total Min. Agric. Dev.						**112,500**	**112,500**	**112,500**	**112,500**	**450,000**	
Sub Total OUTCOME 1						**2,903,103**	**3,082,377**	**2,914,523**	**2,878,260**	**11,778,263**	
OUTCOME 2: Institutional capacity of the agricultural and water sector enhanced, including information and extension services to respond to climate change, including variability.	CNEDD/UNDP		ITALIE - CILSS	72100	Contractual Services-Companies (Downscaling of Sahel Climate Information)	40,000	40,000	40,000	40,000	**160,000**	2.1
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72100	Contractual Services-Companies (Train NMD Staff to Broadcast Forecast Data)	9,000	9,000			**18,000**	2.1
	CNEDD/UNDP		GEF	72100	Contractual Services-Companies (Develop and Configure Broadcast Software and Databases)	10,000	10,000	10,000	10,000	**40,000**	2.1
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72200	Non-expendable Equipment (Computers)	10,000				**10,000**	2.1
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72100	Contractual Services-Companies (Community Radio Installation)	65,000	65,000			**130,000**	2.1
	CNEDD/UNDP		ITALIE - CILSS	72100	Contractual Services-Companies (Community Radio Installation)	100,000	100,000			**200,000**	2.1
	CNEDD		GEF	71300	Consultancy Services – Individual (Policy Revision e.g. Niger	11,000	11,000			**22,000**	2.2

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
					Rural Code, RDS, PRS)						
	CNEDD		GEF	71300	Consultancy Services – Individuals (Develop Local Strategies to Enable Pastoralists to Adapt to Climate Change)	10,000	10,000	10,000		**30,000**	2.2
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	74525	Lobby for Incorporation of New Pastoralism Strategies into Planning	5,000				**5,000**	2.2
	CNEDD/UNDP		GEF	71300	Consultancy Services – Individuals (Policy Revision of Commune Development Strategies at the Project Sites)	15,000	15,000			**30,000**	2.2
	CNEDD/UNDP		GEF	71300	Consultancy Services – Individuals (Training of Ministry Government Staff (including Systems Modelling)	49,000	49,000	49,000	49,000	**196,000**	2.3
	CNEDD/UNDP		GEF	71300	Consultancy Services – Individuals (Training of Regional Government Staff)	46,000	46,000	46,000	46,000	**184,000**	2.3
	CNEDD/UNDP		GEF	71300	Consultancy Services – Individuals (Training of Department Government Staff)	25,000	25,000	25,000	25,000	**100,000**	2.3

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	71300	Consultancy Services – Individuals (Inclusion of Climate Change Risks in IWRM Plan)	11,000	11,000			**22,000**	2.4
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	71300	Training – Inclusion of Climate Change Risks into IWRM Plan			7,000	7,000	**14,000**	2.4
	CNEDD/UNDP		GEF	71300	Consultancy Services – Individuals (Model Climate Change Impact on Water Supplies)	15,000	15,000			**30,000**	2.4
	CNEDD/UNDP		UNDP	72100	Contractual Services-Companies (Creation of Savings and Credit Institutions)	9,000	9,000	9,000	9,000	**36,000**	2.5
	CNEDD/UNDP		UNDP	71300	Training and Establishment of Management Committees for Savings and Credit Institutions	30,000	30,000			**60,000**	2.5
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72100	Contractual Services -Companies (Construction and Maintenance of Facilities for Local Entrepreneurial Activities)	30,000	30,000	30,000	30,000	**120,000**	2.5
	CNEDD/UNDP		UNDP	72100	Contractual Services -Companies (Construction and Maintenance of Sewing Centres)	6,000	6,000	6,000	6,000	**24,000**	2.5

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72200	Non-expendable equipment (Provision of Grinding Machines)	5,000				**5,000**	2.5
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72100	Contractual Services (Development and Implementation of Public Awareness Campaigns)	55,000	55,000	55,000	55,000	**220,000**	2.5
	CNEDD/UNDP		GEF	72100	Contractual Services (Training of Teachers and Development of School Courses on Climate Change)	54,000	54,000	34,000	34,000	**176,000**	2.5
	CNEDD/UNDP		GEF	72100	Contractual Services (Development of University Courses on Climate Change)	20,000	20,000	20,000	20,000	**80,000**	2.5
	CNEDD/UNDP		GEF	72100	Contractual Services (Training and Establishment of Management Committees for Entrepreneurial Activities).	10,000	10,000	10,000	10,000	**40,000**	2.6
	CNEDD/UNDP		GEF	71600	Duty Travel (PMU Staff, Project-Related Government Staff)	7,842	7,000	7,000	7,000	**28,842**	2.7
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72200	Non-expendable Equipment (Motorcycles and Computers)	20,000	20,000	20,000	20,000	**80,000**	2.8
Sub Total GEF						**272,842**	**272,000**	**211,000**	**201,000**	**956,842**	
Sub Total						**45,000**	**45,000**	**15,000**	**15,000**	**120,000**	

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
UNDP											
Sub Total Min. Anim. Res.						**210,000**	**190,000**	**112,000**	**112,000**	**624,000**	
Sub Total Italie -CILSS						**140,000**	**140,000**	**40,000**	**40,000**	**360,000**	
Sub Total OUTCOME 2						**667,842**	**647,000**	**378,000**	**368,000**	**2,060,842**	
OUTCOME 3: Lessons learned and knowledge management component established.	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	71300	Consultancy Services – Individuals (Knowledge Management Expert for Capturing and Sharing Knowledge and Learning)	10,500	10,500	10,500	10,500	**42,000**	3.1
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	74100	Printing	4,000	4,000	4,000	4,000	**16,000**	3.1
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	74100	Production of a Video Documentary, Adaptation Guide Booklet, Pamphlets and CD's.	9,000	9,000	9,000	9,000	**36,000**	3.1
	CNEDD/UNDP		ITALIE - CILSS	72100	Contractual Services – Companies (Database Development and Maintenance of the Project)	15,000	15,000	20,000	20,000	**70,000**	3.1
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	72100	Contractual Services – Companies (Website Development and Maintenance for the Project)	12,000	12,000	12,000	12,000	**48,000**	3.1

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
	CNEDD/UNDP		ITALIE - CILSS	72100	Contractual Services – Companies (UNDP ALM)		10,000	10,000	10,000	**30,000**	3.1
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	74525	National Workshops and International Conferences	20,000	20,000	20,000	20,000	**80,000**	3.1
	CNEDD/UNDP		UNDP	74525	Regional Workshops	20,000	20,000	20,000	20,000	**80,000**	3.1
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	74500	Dissemination of Workshop Proceedings (Hardcopy, CD)				10,000	**10,000**	3.1
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	71600	Duty Travel (Including Air Travel, Petrol, etc.)	9,500	9,500	9,500	9,500	**38,000**	3.2
	CNEDD/UNDP		GEF	71600	Duty Travel (Including Air Travel, Petrol, etc.)	5,000	5,000	5,000	5,000	**20,000**	3.2
	CNEDD/UNDP		GEF	74500	Sundries	2,000				**2,000**	3.2
	CNEDD/Min. Anim. Res./UNDP		Min. Anim. Res.	74500	Sundries		2,000	2,000	2,000	**6,000**	3.2
Sub Total GEF						**7,000**	**5,000**	**5,000**	**5,000**	**22,000**	
Sub-Total UNDP						**20,000**	**20,000**	**20,000**	**20,000**	**80,000**	
Sub Total Min. Anim. Res.						**65,000**	**67,000**	**67,000**	**77,000**	**276,000**	
Sub Total Italie – CILSS						**15,000**	**25,000**	**30,000**	**30,000**	**100,000**	
Sub Total						**107,000**	**117,000**	**122,000**	**132,000**	**478,000**	

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
OUTCOME 3											
Project Co-ordination Unit (PCU)	CNEDD/UNDP		GEF	72500	Expendable Equipment (Stationery, Paper, Consumables, etc)	5,000	5,000	5,000	5,000	**20,000**	4.6
	CNEDD/UNDP		GEF	72200	Non-expendable Equipment	10,000	2,000	2,000	2,000	**16,000**	4.7
	CNEDD/UNDP		GEF	73400	Operations and Maintenance	8,000	8,000	8,000	8,000	**32,000**	4.8
	CNEDD		CNEDD	73400	Telephone, Fax, Email, Internet, etc.	8,000	8,000	8,000	8,000	**32,000**	4.8
	CNEDD		CNEDD	73400	Water and Electricity	2,000	2,000	2,000	2,000	**8,000**	4.8
	CNEDD		CNEDD	73400	Office Rental	4,500	4,500	4,500	4,100	**17,600**	4.8
	CNEDD/UNDP		GEF	73400	Reports – Printing	2,500	2,500	2,500	2,500	**10,000**	4.9
	CNEDD/UNDP		GEF	74500	Sundries	2,000	2,000	2,000	1,095	**7,095**	4.9
	CNEDD/UNDP		CNEDD	71300	Project Director	20,000	20,000	20,000	20,000	**80,000**	4.1
	CNEDD/UNDP		CNEDD	71400	Administrative and Financial Assistants	15,600	15,600	15,600	15,600	**62,400**	4.2
	CNEDD/UNDP		GEF	71300	Consultancy Services – Individuals (National Consultants – Administrative, Financial and Database Management)	10,000	10,000	10,000	10,000	**40,000**	4.3
	CNEDD/UNDP		GEF	71300	Consultancy Services – Individuals (National Consultants – Technical)	18,900	18,900	18,900	18,900	**75,600**	4.4
	CNEDD/UNDP		GEF	71300	Consultancy Services	9,300	9,300	9,300	9,300	**37,200**	4.5

GEF Outcome/Atlas Activity	Responsible Party	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total (USD)	Budget Note
					– Individuals (International Consultants – Technical)						
Sub Total GEF						**65,700**	**57,700**	**57,700**	**56,795**	**237,895**	
Sub Total CNEDD						**50,100**	**50,100**	**50,100**	**49,700**	**200,000**	
Sub-Total PCU						**115,800**	**107,800**	**107,800**	**106,495**	**437,895**	
Indicative Monitoring and Evaluation	CNEDD/UNDP		GEF	74500	Indicative Monitoring (Inception Workshop, Mid-term and Terminal External Evaluation etc)	20,000	25,000	25,000	25,000	**95,000**	4.10
Sub Total for Monitoring and Evaluation						**20,000**	**25,000**	**25,000**	**25,000**	**95,000**	

SUMMARY				**GEF**					**3,500,000**
				Co-financing					**10,950,000**
				CNEDD					**200,000**
				UNDP Niger					**200,000**
				TOTAL					**14,850,000**

1. Management committees: seed dissemination, cereal banks, fertilizer/pesticide banks, fodder banks, irrigation/vegetable gardens, drinking water supply (MEAP), sand dune stabilisation, banquettes, gabions/weirs, windbreaks, firebreaks and invasive plant clearing.
2. Monitoring and evaluation: Project Inception Workshop, Annual project implementation reviews, annual project report, tripartite review meetings, yearly field visits, field visit reports, terminal tripartite review, inception report, periodic thematic report, quarterly progress report, terminal reports, project terminal report, project publications, mid-term evaluation and final evaluation.

Budget notes pertaining to Total Budget and Workplan

Table 11: Allocation for Outcome I: Resilience of food production systems and/or food insecure communities enhanced in the face of climate change.

Budget Description	Ref
Output 1.1. Seeds of tried and tested drought-resilient crop varieties disseminated. **Contractual Services-Companies:** Local companies will be contracted at each site to disseminate seeds to local farmers. A minimum of 500 farmers will be supplied with seeds. The UNDP Niger Office will ensure that seeds are bought at competitive prices and that farmers are allocated all of the purchased seeds. CNEDD to determine the amount of seed to be given to each farmer, and the farmer selection process. The Min. Agric. Dev. to advise on which soil types the seeds should be sown and the method of cultivation. Decisions on the area to be cultivated will be taken by the project's technical committee. The TOR will be developed by the CNEDD, Min. Agric. Dev., and the UNDP. **Budget: US$ 728,000**.	**1.1**
Output 1.2. Farm trials of drought-resilient crop varieties (that are not tried and tested) undertaken. **Contractual Services-Companies:** Local companies will be contracted at each site to undertake farm trials. A minimum of 5 hectares per project site will be cultivated as trials. The Min. Agric. Dev. to advise on which soil types the seeds should be sown and the method of cultivation. The area under trial and the number of locations of trial plots will be determined by the project's technical committee. The TOR will be developed by the CNEDD, Min. Agric. Dev., and the UNDP. **Budget: US$ 560,000**.	**1.2**
Output 1.3. Cereal banks constructed and managed. **Contractual Services-Companies:** Local companies will be contracted at each site to construct and rehabilitate cereal banks. The management of the banks is covered in Ref. 1.12 of this table. A minimum of 27 cereal banks will be constructed and 3 cereal banks rehabilitated. The project's technical committee will determine the appropriate dimensions and construction standards for the cereal banks. Cereal supplies will be provided by the project for each cereal bank. The TOR will be developed by the CNEDD, Min. Agric. Dev., and the UNDP. **Budget: US$ 469,000**.	**1.3**
Output 1.4. Fodder/feed banks constructed and managed. **Contractual Services-Companies:** Local companies will be contracted at each site to construct fodder banks. The management of the banks is covered in Ref. 1.12 of this table. A minimum of 13 fodder banks will be constructed. The project's technical committee will determine the appropriate dimensions and construction standards for the fodder banks. Fodder supplies will be provided by the project for each fodder bank. The TOR will be developed by the CNEDD, Min. Agric. Dev., and the UNDP. **Budget: US$ 202,000**.	**1.4**
Output 1.5. Fertilizer/pesticide shops constructed and managed. **Contractual Services-Companies:** Local companies will be contracted at each site to construct fertilizer/pesticide shops. The management of the shops is covered in Ref. 1.12 of this table. A minimum of 3 shops will be constructed. The project's technical committee will determine the appropriate dimensions and construction standards for the shops. Supplies for the shops will be provided by the project. The TOR will be developed by the CNEDD, Min. Agric. Dev., and the UNDP. **Budget: US$ 34,000**	**1.5**
Output 1.6. Wells and drinking water supplies for both human and livestock use constructed. **Contractual Services-Companies:** Local companies will be contracted at each site to construct wells and drinking supply networks. A minimum of 172 wells will be constructed and a minimum of 7 drinking water supply networks. The project's technical committee will determine the appropriate dimensions and construction standards for the wells and drinking water supply networks. The TOR will be developed by the CNEDD, Min. Agric. Dev., Min. Anim. Res., and the UNDP.	**1.6**

Budget: US$ 1,743,000	
Output 1.7. Area under irrigation at a village level expanded. **Contractual Services-Companies:** Local companies will be contracted at each site to expand the area under irrigation. This will entail preparation of the land, constructing fences, supplying vegetable seeds, sinking wells, installing appropriate irrigation networks, planting and maintaining windbreaks, and preparing and maintaining firebreaks. A minimum of 155 hectares of land will be developed for irrigation agriculture. The project's technical committee will determine the appropriate size of the irrigated blocks at each site. The Min. Agric. Dev. will advise on the appropriate soil types for the cultivation of different vegetables and crops. The TOR will be developed by the CNEDD, Min. Agric. Dev., and the UNDP. **Budget: US$ 3,718,200**	**1.7**
Output 1.8. Soils in degraded agricultural landscapes stabilised by using soil and water conservation measures (CES/DRS), including banquettes. **Contractual Services-Companies:** Local companies will be contracted at each site to construct banquettes. A minimum of 1602 hectares of degraded agricultural land will be restored through the construction of the banquettes, calculated according to a cost of $350 dollars per hectare of restoration. Productivity of the landscape will improve by at least 25%. The project's technical committee will determine the appropriate area to be restored at each site, and the dimensions of banquettes on different soil types at the different sites. The Min. Agric. Dev. will advise on the appropriate soil types for the cultivation of different crops at the different sites. The TOR will be developed by the CNEDD, Min. Agric. Dev., and the UNDP. **Budget: US$ 561,000**	**1.8**
Output 1.9. Soils in pastoral landscapes stabilised using soil and water conservation measures (CES/DRS), including banquettes, planting trees and sowing seeds of drought-resilient fodder species. **Contractual Services-Companies:** Local companies will be contracted at each site to construct banquettes. A minimum of 4895 hectares of degraded pastoral land will be restored through the construction of the banquettes, calculated according to a cost of $350 dollars per hectare of restoration. Productivity of the landscape will improve by at least 25%. The project's technical committee will determine the appropriate area to be restored at each site, and the dimensions of banquettes on different soil types at the different sites. The TOR will be developed by the CNEDD, Min. Agric. Dev., Min. Anim. Res., and the UNDP. **Budget: US$ 1,713,263**	**1.9**
Output 1.10. Dunes around micro-basins stabilised. **Contractual Services-Companies:** Local companies will be contracted at each site to stabilize dunes through restoration of indigenous vegetation. A minimum of 470 hectares of degraded sand dunes will be restored through planting of trees and sowing of grasses. This land area is calculated according to a cost of $850 dollars per hectare of restoration. The project's technical committee will determine the appropriate area to be restored at each site, and the types of plants to be planted or sown on different soil types at the different sites. The TOR will be developed by the CNEDD, Min. Agric. Dev., Min. Anim. Res., and the UNDP. **Budget: US$ 400,000**	**1.10**
Output 1.11. Gabions and weirs constructed where loss of river banks to floods is threatening village infrastructure and agricultural land. **Contractual Services-Companies:** Local companies will be contracted at each site to stabilize river banks through construction of gabions and weirs, as well as the restoration of indigenous vegetation. A minimum of 500 meters of river bank will be stabilized at each of the four sites: Aderbissanat, Badoko, Sakabel and Soudouré. Water Basin Management Schemes will also be developed and implemented at these sites by the contracted companies. Finally, alien invasive vegetation will be removed along 5 km of river bank at the village of Soudouré. The project's technical committee will determine the appropriate area to be stabilised at each site. The TOR will be developed by the CNEDD, Min. Agric. Dev., Min. Anim. Res., and the UNDP. **Budget: US$ 1,252,800**	**1.11**
Training and establishment of Management Committees for land use activities in Outcome 1. All of the activities in Budget Notes 1.1 to 1.10 will require management committees to manage and maintain the activities. This part of the project is critical for ensuring sustainability. **Contractual Services-Companies:** A company will be contracted to train and establish these management committees. Lessons from previous projects that have used management committees will be researched and incorporated into the contract. The project's technical committee will select, approve and amend the proposed action plan for training and establishing the committees. In many cases a single management committee could be established to maintain several project activities. The decisions on how many committees to establish at each site will be taken by the technical committee during the implementation of the outputs in Outcome 1. The TOR will be	**1.12**

developed by the CNEDD, Min. Agric. Dev., Min. Anim. Res., and the UNDP. **Budget: US$ 280,000**	
M&E Expert Monitoring and evaluation of Outcome activities will determine the impact of the interventions on landscape productivity and human welfare. This underpins the entire project and consequently a rigorous, scientific approach is necessary. The data generated through this M&E will be used to produce scientific papers in the peer-reviewed international literature, and consequently the expert contracted should have a proven track record in publishing in this literature. The technical committee will select, approve and amend the proposed M&E methodology at each site. Importantly, the methodologies selected should apply across all sites in order to make scientific comparisons of the impact of the same interventions at different sites. **Budget: US$ 69,000**	**1.13**
Duty Travel and Sundry The duty travel and sundry budget will cover the travel and sundry expenses of PMU Staff, and Project Related Government Staff for activities in Outcome 1. **Budget: US$ 48,000.**	**1.14**

Table 12: Allocation for Outcome II: Institutional capacity of the agricultural and water sector enhanced, including information and extension services to respond to climate change, including variability

Budget Description	**Ref**
Output 2.1. Institutional capacity to support climate risk management in pastoral and agricultural land management at the national, district and village level developed. **National Meteorological Department** **Contractual Services-Companies:** A company will be contracted to train NMD staff to provide short- and medium-term forecasts from downscaling of available data in a format that is suitable for use by subsistence farmers. This training will be ongoing for the duration of the project and will entail consultants working directly with NMD staff to develop and/or configure the appropriate software and databases. A company will also be contracted to construct radio transmitters at all the project sites. The TORs will be developed by the CNEDD, NMD, and the UNDP. **Non-expendable equipment:** 10 computers for downscaling calculations will be supplied to the NMD. The specifications for the purchase will be made by the technical committee and approved by the CNEDD, NMD and UNDP. **Budget: US$ 558,000**	**2.1**
Output 2.1. Institutional capacity to support climate risk management in pastoral and agricultural land management at the national, district and village level developed. **Revision of policies** **Consultancy Services - Individuals:** Consultants will be contracted to review and propose revisions to the Niger Rural Code in terms of adapting to climate change and ensuring that rangelands are used in a sustainable manner. They will also develop local strategies that enable pastoralists to adapt to climate change, and together with project staff, lobby for the incorporation of these strategies into planning undertaken by the COFO from a village to a regional level. Lastly, they will revise the Commune Development Strategies for each site in such a way that climate change is a key focus of the document. The TORs will be developed by the CNEDD, NMD, and the UNDP. **Budget: US$ 57,000**	**2.2**
Output 2.1. Institutional capacity to support climate risk management in pastoral and agricultural land management at the national, district and village level developed. **Training of government staff** **Consultancy Services - Individuals:** Consultants will be contracted to train government staff in adaptation to climate change at a national level in ministries, at a regional level and a departmental level. One of the aspects of the training will be to explain the revisions to the Niger Rural Code, pastoral strategies, and Commune Development Strategies. This training underpins the capacity building of the project within government, and at the end of the project at least 500 staff will be trained in climate change and the revisions to policies. An important component of the training will be systems modelling, where key government decision makers will be exposed to the potential	**2.3**

impacts of climate change and the different options for adapting to climate change. The TORs will be developed by the CNEDD, NMD, and the UNDP, and approved by the project's technical committee. **Budget: US$ 510,000**	
Output 2.2. Institutional capacity to incorporate climate change risks into water supply and management developed. **Consultancy Services - Individuals:** Consultants will be contracted to consult the partners and stakeholders in the IWRM Plan to determine where climate change risks can be incorporated into the plan. They will also, together with project staff, lobby for changes to the IWRM plan that ensure climate change is taken into account in Niger's long-term water planning. The consultants will provide training to the appropriate departments to ensure that the recommendations in the IWRM plan with respect to climate change are followed. This training will be done in conjunction with training in Output 2.1. This training can only be developed once the consultations and recommendations for changes to the plan have been made. It is likely that there will be a need for modelling climate change impacts on water supplies in different regions, and the potential for using groundwater to alleviate the climate change pressures. The capacity for this type of modelling will be developed within government departments. The TORs will be developed by the CNEDD, NMD, and the UNDP, and approved by the project's technical committee. **Budget: US$ 66,000**	**2.4**
Output 2.3. Institutional capacity to create alternative climate-resilient livelihoods for farmers and pastoralists developed. **Contractual Services:** Companies and consultants will be contracted to: create savings and credit institutions at each project site (i.e. mutual benefit societies); train and establish management committees for the institutions; construct facilities for local entrepreneurial activities such as sale of vegetables from irrigated gardens (all sites), offices for credit institutions and a sewing centre (Soudouré); develop and implement public awareness campaigns on climate change risks and adaptation at a national level and at a site level; train school children (local schools at all sites) and university students in environmental sciences (in Niamey) on climate change risks and adaptation; and train school teachers at all sites on climate change and adaptation to climate change. The TORs for each one of these separate activities will be developed by the CNEDD, NMD, and the UNDP, and approved by the project's technical committee. **Budget: US$ 721,000**	**2.5**
Training and establishment of Management Committees for updating systems models of Outcome 2.1 and maintaining the entrepreneurial activities in Outcome 2.3. **Contractual Services:** Companies or consultants will be contracted to train and establish the management committees. Lessons from previous projects that have used management committees will be researched and incorporated into the contract. The project's technical committee will select, approve and amend the proposed action plan for training and establishing the committees. The TOR will be developed by the CNEDD, Min. Agric. Dev., Min. Anim. Res., and the UNDP. **Budget: US$ 40,000**	**2.6**
Duty Travel and Sundry The duty travel and sundry budget will cover the travel and sundry expenses of PMU Staff, and Project Related Government Staff for activities in Outcome 2. **Budget: US$ 28,842.**	**2.7**
Non-expendable equipment In order for government staff to carry out their functions and to monitor and record project activities, transport is required (in the form of motor-cycles) and data storage capacity is required (i.e. computers). The requirements will vary from site to site and on an annual basis according to the resources allocated to each department. The purchases will be approved by the CNEDD, Min. Agric. Dev., Min. Anim. Res., and the UNDP. **Budget: US$ 80,000**	**2.8**

Table 13: Allocation for Outcome III: Lessons learned and knowledge management component established

Budget Description	**Ref**
Output 3.1. Knowledge and lessons learned to support implementation of adaptation measures compiled and disseminated. **Contractual Services:** Companies and consultants will be contracted to: document lessons learned from the project on a continual basis and present the lessons in a summary document that is distributed to all stakeholders; submit all technical reports and documents on lessons learned to the ALM; develop a project website, which includes a project	**3.1**

database and all reports; develop a briefing paper on the lessons learned from the project for publication in a peer-reviewed journal and for presentation at an international conference on adaptation to climate change; conduct one national and 8 regional workshops for dissemination of project lessons within Niger and across the Sahel; publish workshop proceedings and distribute these in hardcopy, on CD and on the project website; develop videos, booklets and pamphlets on lessons learned for policy makers, the general public and school children; and develop radio broadcasts to disseminate lessons learned to rural farmers. The TORs for each one of these separate activities will be developed by the CNEDD, NMD, and the UNDP, and approved by the project's technical committee. **Budget: US$ 412,000**	
Duty Travel and Sundry The duty travel and sundry budget will cover the travel and sundry expenses of PMU Staff, and Project Related Government Staff for activities in Outcome 2. **Budget: US$ 66,000.**	**3.2**

4. Project Coordination Unit

The Project Co-ordination Unit will be housed within the CNEDD and will hire services on a contractual or consulting basis, depending on the skills available in Niger.

Table 14: Budget distribution for the project coordination unit

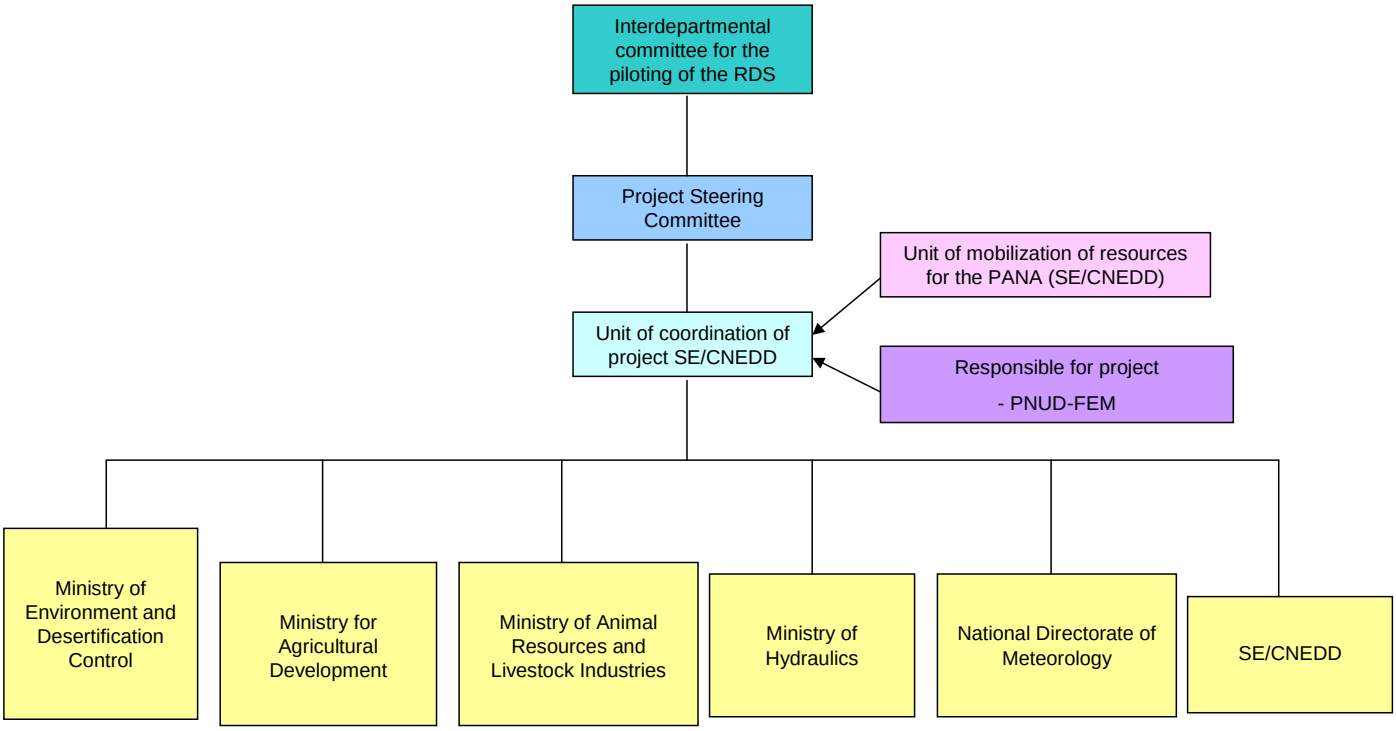
Budget Description	Ref
Project Director – annual salary of US$ 20,000. **Budget: US$ 80,000**	**4.1**
Administration and Finance Assistants – annual salaries of US$ 7,800 each (two individuals). **Budget: US$ 62,400**	**4.2**
Administration, Finance and Database Consultants: These consultants will be responsible for supplying information to the Administration and Finance Manager and for compiling a project database. **Budget: US$ 40,000**	**4.3**
Technical Local Consultants: These consultants will be responsible for ensuring that all project activities are undertaken using best practices in terms of sustainable land management. The consultants will work closely with the technical committee, and will assess and assist in the development of all plans for on-the-ground interventions. **Budget: US$ 75,600**	**4.4**
Technical International Consultants: The international consultant will be responsible for ensuring that the project activities are undertaken at a standard comparable to best practices in other countries. The consultant will have expert knowledge in climate change, adaptation to climate change (specifically in other dry countries), and the agricultural and water sectors. **Budget: US$ 37,200**	**4.5**
Expendable Equipment – including stationary, paper, and other consumables related to operation of Project Co-ordination Unit. **Budget: US$ 20,000**	**4.6**
Non-Expendable Equipment – including 5 laptop computers, fax machine, photocopier, printer, and scanner. **Budget: US$ 16,000**	**4.7**
Operations and Maintenance - repairing and maintenance of equipment, vehicle rentals, fuel, telephone, fax, email, internet, office rental. **Budget: US$ 89,600**	**4.8**
Sundries – including printing of reports. **Budget: US$ 17,095**	**4.9**
Monitoring and evaluation – including Inception Workshop, Annual status reports/seminar/workshops, technical reports, knowledge and advocacy material, Mid-term External Evaluation, and Terminal External Evaluation. **Budget: US$ 95,000**	**4.10**

SECTION IV: Additional information

PART I: Other Agreements

GEF Operational Focal Point Letters and Co-financing Letters attached.

PART II: Organigram of the Project



PART III: Terms of Reference for Key Project Groups, Staff, and Sub-contracts

A. National Steering Committee

The National Steering Committee (SC) will be established by the National Council of Environment for Sustainable Development (CNEDD) with the following possible composition. The SC will meet twice per year, or if necessary, meetings may be held more frequently.

1) Representative of the Rural Development Strategy Secretariat;
2) Representative of the Ministry of Agricultural Development;
3) Representative of the Ministry Environment and Desertification Control;
4) Representative of the Ministry of Animal Resources and Livestock Industries;
5) Representative of the Ministry of Community Development and Land Management;
6) Representative of the Ministry of Hydraulics;
7) Representative of the Ministry of Economy and Finance;
8) Representative of the National Council of Environment for a Sustainable Development (CNEDD);
9) Representative of the National Directorate of Meteorology;
10) 8 Representatives of the Municipalities Councils (1 from each project communes);
11) Representative of the National Institute for Agricultural Research (INRAN),
12) Representative of the University of Niamey (Department of Agriculture);
13) Two Representatives from Civil Society Organizations;

14) Representative of UNDP, Niger;
15) 8 Representatives of the Regional Councils for Environment and Sustainable Development (CREDD)

The SC will be chaired by the Executive Secretary of the Council of Environment for a Sustainable Development (CNEDD). The SC can co-opt members as deemed necessary provided that these members have a direct bearing or important role on the successful implementation of the project.

Responsibilities

- Establish policies to define the functions, responsibilities, and delegation of powers for the implementing agencies and the Project Co-ordination Unit;
- Provide overall guidance on budget management and project activities;
- Facilitate coordination of project activities across institutions;
- Review project activities, and their adherence to the work plan set forth in the project document;
- Take decisions on the issues brought to its notice by cooperating agencies, departments, institutions, and UNDP;
- Provide advice and guidance on efficient and timely execution of the project;
- Initiate remedial action to remove impediments in the progress of project activities that were not envisaged earlier;
- Deal with any other issue brought to the attention of the board by the PCU or any implementing partner.

B. National Project Director (NPD)

The National Council of Environment for a Sustainable Development (CNEDD) will appoint a National Project Director (NPD) to be responsible, on behalf of the government, for the project. The NPD will be a senior official. The NPD will be responsible for the overall administration, management, coordination, implementation, monitoring, and reporting. The NPD will act as the Executive of the Project Board in accordance with RMG/UNDP. The NPD will head the Project Co-ordination Unit (PCU), and will be supported by M&E Expert, PCU office staff, local experts and an international consultant.

Responsibilities

- Ensure effective partnership with the Ministries directly concerned with the project implementation and other implementing partners in the project;
- Ensure that project activities are integrated and coordinated with the established operations of the Rural Development Strategy (RDS);
- Develop and maintain close linkages with relevant sectoral government agencies, UNDP-GEF, NGOs, civil society, international organizations, and implementing partners of the project;
- Supervise and lead the project team in discharging their duties at an optimum level through ensuring efficient and effective resources utilization;
- Facilitate the day-to-day functioning of the PCU;
- Manage human and financial resources, in consultation, to achieve results in line with the outputs and activities outlined in the project document;
- Lead the preparation and implementation of the annual results-based work plans and logical frameworks as endorsed by the management;
- Co-ordinate project activities with related and parallel activities both within RDS Key ministries and with external implementing partner agencies;
- Monitor project activities, including financial matters, and prepare monthly and quarterly progress reports, and organize monthly and quarterly progress reviews;
- Organize Outcome Board meetings;

- Coordinate the distribution of responsibilities amongst team members and organize the monitoring and tracking system of all the project;
- Report and provide feedback to UNDP-GEF and the Outcome Board on project strategies, activities, progress, and barriers;
- Manage relationships with project stakeholders including donors, NGOs, government agencies, and others as required;

With the support of the other project staff, the NPD shall:

- Oversee establishment of the PMU, with systems for the sound management of all project activities, implementation arrangements with partner agencies, and financial disbursements;
- Prepare with the support of M&E expert detailed annual breakdowns of the work plan for all project objectives;
- Identify resource requirements, responsibilities, task outlines, performance evaluation criteria, and work plans based on the FSP and project progress;
- Develop with the support of M&E expert detailed and measurable quarterly performance indicators for each project output at the outset of the project based on the FSP;
- Prepare with the support of M&E expert quarterly work plans, which include indications of the extent to which the previous quarter's activities have contributed to the project's overall objectives;
- Prepare and finalize detailed Term of Reference and qualifications for each national and international expert;
- Submit with the support of M&E expert, as required, Annual Performance Review (APR) to tripartite (TPR) review meetings;
- Direct and supervise the establishment of project administration procedures for all staff, subcontracting organizations/individuals, and participating agencies;
- Approve quarterly status and financial reports for comment and approval by the Outcome Board;
- Approve annual budget forecast requests for approval by the Outcome Board;
- Oversee implementation of Outcome Board directives.

C. Monitoring & Evaluation Expert

The Monitoring and Evaluation (M&E) Expert will report directly to the National Project Director (NPD). He will lead the project team including implementing partners through the planning, implementation, and delivery of policies, reports, knowledge products, and other results approved in the project document and annual work plans. He will design and implement a system to identify, analyze, document and disseminate lessons learned. While the NPD will oversee monitoring and evaluation activities, the M&E Expert will provide the on-the-ground support needed to closely evaluate progress and barriers and to prepare detailed quarterly, annual, and other monitoring reports.

The M&E policy at the project level in LDCF/GEF/UNDP has four objectives: i) to monitor and evaluate results and impacts; ii) to provide a basis for decision making on necessary amendments and improvements; iii) to promote accountability for resource use; and iii) to document, provide feedback on, and disseminate lessons learned. Project monitoring and evaluation is conducted in accordance with established UNDP and GEF procedures and is undertaken by the project team and the UNDP CO with support from UNDP-GEF. The Strategic Results Framework provides performance and impact indicators for project implementation along with their corresponding means of verification. These, along with the objectives, procedures, and tools described in the project document's M&E plan will form the basis on which the project's M&E system will be built.

Responsibilities

i) M&E

- Establish the overall M&E strategy in accordance with the M&E plan outlined in the project document and promote a results-based approach;
- Provide timely and relevant information to the NPD, Project Manager, PMU, and other project stakeholders;
- Co-ordinate and maintain close communication with the NPD, Outcome Board representatives, representatives of primary stakeholder groups, external consultants, and field staff, as well as with members of external M&E-related missions;
- Guide and coordinate the review of the project Strategic Results Framework, including:
    a. Provide technical advice for the revision of performance indicators
    b. Ensure realistic intermediate and end-of-project targets are defined
    c. Conduct a baseline study (situation at project start)
    d. Identify sources of data, collection methods, who collects data, how often, cost of collection and who analyzes it
    e. Ensure all critical risks are identified
- Coordinate the preparation of all project reports. Guide staff and executing partners in preparing their progress reports in accordance with approved reporting formats and ensure their timely submission. This includes quarterly progress reports, annual project report, inception report, and ad-hoc technical reports. Reports should identify problems and causes of potential bottlenecks in project implementation, and provide specific recommendations.
- Foster participatory planning and monitoring by training and involving primary stakeholder groups in the M&E of activities;
- Monitor the follow up of evaluation recommendations;
- Organise (and provide) refresher training in M&E for project and implementing partner staff, local organisations, and primary stakeholders to develop local M&E capacity.

ii) Knowledge Management

- Consolidate a culture of lessons learning involving all project staff and allocate specific responsibilities;
- Ensure that TOR for consultants recruited by the project also incorporate mechanisms to capture and share lessons learned through their inputs to the project, and to ensure that the results are reflected in the M&E reporting system and the Adaptation Learning Mechanism;
- Document, package, and disseminate lessons at least once every 12 months;
- Facilitate exchange of experiences by supporting and coordinating participation in any existing network of UNDP-GEF projects sharing common characteristics. These networks would largely function on the basis of an electronic platform but could also entail other methods and tools such as workshops, teleconferences, etc.
- Identify and participate in additional networks, for example scientific or policy-based networks that may also yield lessons that can benefit project implementation.
- Capture lessons learned from the project on a continual basis and synthesize results of activities under Outcomes 1, 2, and 3.
- Collate technical reports and other documents from the project and contribute to the ALM. Guidelines for extracting lessons learned will be drawn from the ALM.
- Develop and publish (in a peer-reviewed international journal) a briefing paper on lessons from the project.

Qualifications

- Post-graduate degree in a field related to development and/or management and experience in Monitoring and Evaluation.
- Statistical skills essential with knowledge of environmental and development applications.
- At least several years of proven experience with:
    a. The logical framework and other strategic planning approaches
    b. M&E methods and approaches (including quantitative, qualitative and participatory)

c. Planning, design, and implementation of M&E systems
d. Training in M&E development and implementation and/or facilitating learning-oriented analysis sessions of M&E data with multiple stakeholders
e. Data and information analysis
f. Report writing

- A solid understanding of adaptation to climate change and environmental management, with a focus on participatory processes, joint management, and gender issues.
- Familiarity with, and a supportive attitude towards, processes to strengthen local organisations and build local capacities for self-management.
- Willingness to undertake regular field visits and interact with different stakeholders, especially primary stakeholders.
- Leadership qualities, personnel and team management (including mediation and conflict resolution).
- Understanding of UNDP and GEF procedures.
- Experience in data processing and with computers.
- Experience in knowledge management and evaluations.
- Excellent verbal and written English and French skills.

D. Administration and Finance Assistants

Two Administration and Finance Assistants will report to the NPD.

Responsibilities

- Standardize the finance and accounting systems of the project while maintaining compatibility with Government of Niger and UNDP financial and accounting procedures
- Prepare budget revisions of the projects based on the PDRs and CDRs; assist in the preparation of the AWP
- Comply and verify budget and accounting data by researching files, calculating costs, and estimating anticipated expenditures from readily available information sources, in particular partner agencies
- Prepare status report, progress reports, Annual Development Programme (ADP) report, IMED reports, ERD reports, and other required financial reports
- Process all types of payment requests for settlement purpose including quarterly advances to the partners upon joint review with the PC and FA following the existing RMG/UNDP financial rules and regulations
- Prepare periodic accounting records by recording receipts and disbursements (ledgers, cash books, vouchers, etc.) and reconciling data for recurring or financial special reports and assist in preparation of annual procurement plan
- Undertake project financial closure formalities including submission of terminal reports, transfer and disposal of equipment, processing of semi-final and final revisions, and support professional staff in preparing the terminal assessment reports
- Prepare reports and documents as per specified formats, project, or programme plans and general reference documents as well as general administrative/financial or specialized tasks related to the project which may be of a confidential nature within the assigned area of responsibility
- Assist in the timely issuance of contracts and assurance of other eligible entitlements of the projects personnel, experts, and consultants by preparing annual recruitment plans
- In addition to general administration responsibilities, also supervise directly and indirectly tasks of the other support staff under the program
- Provide substantive support to the National Project Director for overall implementation
- Maintain all files and records of the project in both electronic and hard copies
- Prepare monthly leave records for the project staff and international consultants
- Prepare and update inventories of expendable and non-expendable project equipment

- Assist the project team in designing project reports in compliance with GoN and UNDP formats
- Draft necessary correspondence with local agencies and stakeholders

Qualifications

- Bachelor degree in Accountancy, Commerce, Business Management, or other relevant discipline
- At least 3 years practical experience in UN-related projects
- Strong understanding of budgeting and the UN/GoNiger accounting system—candidates familiar with UNDP administrative, program, and financial procedures preferred
- Ability to use MS Office packages under the Windows XP Professional environment
- Initiative, sound judgment, and capacity to work independently
- Proficient verbal and written French skills
- Knowledge of English language is an asset.

E. National and International Consultants

TORs for national and international consultants will be prepared on an ad hoc basis by the National Project Director, the Administration and Financial Manager, and the Monitoring and Evaluation Expert, once a particular activity is approved by the National Steering Committee. The SC will approve the TORs.

PART IV: Stakeholder Involvement Plan

Table 15: Stakeholder Involvement Plan

Stakeholders	Attributions with respect to NAPA	Role in PPG and FSP	Specific Output Responsibilities
Executive Secretariat Rural Development Strategy	• Ensure exchange of information concerning the implementation of the Rural Development Strategy (RDS) • Coordinate monitoring and evaluation of the RDS • Coordinate the implementation of the RDS Action Plan • Coordinate the studies necessary for the implementation of the RDS • Facilitate interaction between the Niger Government and its technical and financial partners for the implementation of the RDS • Prepare and monitor communication in the sector • Facilitate the transfer of resources necessary for RDS implementation and consultation	• Ensure the chairmanship of the PPG Steering Committee • Provided full support to the PPG implementation • Provided technical backstopping in PPG implementation • Ensure the conformity of the FSP with national policies and strategy • Member of the FSP Steering Committee • Contribute to the monitoring and evaluation of the FSP	• Overall supervision of outcomes 1,2 and 3 for policy conformity
Ministry of Environment and Desertification Control	• Implementation of policies and strategies related to natural resources management, environmental preservation and desertification control	• Member of the PPG and FSP steering committees • Resource institution during PPG for activities related to natural resources	• Outputs 1.7 – 1.11

Stakeholders	Attributions with respect to NAPA	Role in PPG and FSP	Specific Output Responsibilities
	• Elaboration and application of legislative and legal framework related to forestry, wildlife, fisheries, desertification control and environmental preservation • Implementation, monitoring and evaluation of programmes and projects relating to desertification control and environmental preservation • Promotion of forest, wildlife and fisheries management • Coordination of activities and environmental impact assessments • The formation and realization of a natural resources inventory • Information, raising awareness and technical backstopping in the area of environmental protection and the fight against desertification	management and environmental preservation • Responsible for coordination and implementation of environmental protection and restoration activities in relation to adaptation to climate risk during the FSP	
Ministry of Hydraulics	• Clarification and implementation of policies and strategies relating to water resources • Elaboration and application of legislative and legal framework relating to water resources • Elaboration, implementation, monitoring and evaluation of programmes and projects relating to water resources • Water resources management • Information, raising awareness and technical backstopping in the area of water resources management	• Member of the PPG and FSP steering committees • Resource institution during PPG for activities relating to water resources • Responsible for the coordination and implementation of activities relating to the adaptation of water resources and the water sector to climate risk during the FSP	• Output 1.6, 2.2
Ministry of Agricultural Development	• Definition and implementation of policies and strategies in the agricultural sector • Elaboration, implementation and monitoring and evaluation of programmes and projects relating to agricultural development, organization and extension services • Elaboration, application and control of legislative and legal frameworks relating to agriculture, rural codes and local farmer organisation • Implementation of programmes relating to improved agricultural production systems and pest control	• Member of the PPG and FSP steering committees • Resource institution during PPG for activities relating to agriculture and agricultural production systems • Responsible for coordination and implementation of activities relating to the adaptation to climate risk of agricultural production during the FSP	• Output 1.2, 1.3, 1.5, 1.7, 3.1
Ministry of Animal Resources and Livestock Industries	• Definition and implementation of policies and strategies in the livestock production sector • Elaboration, implementation, and	• Member of the PPG and FSP steering committees • Resource institution during PPG for activities relating	• Output 1.4,

Stakeholders	Attributions with respect to NAPA	Role in PPG and FSP	Specific Output Responsibilities
	monitoring and evaluation of programmes and projects relating to livestock production and animal industries • Elaboration, application and control of legislative and legal frameworks relating to animal production • Improvement of the animal production system • Monitoring and protection of livestock	to agriculture and agricultural production systems • Responsible for the coordination and implementation of activities relating to adaptation to climate risk of livestock production and management during the FSP	
National Department of Meteorology	• Coordination of national policies on meteorology • Observation of atmospheric activity • Seasonal forecasting and dissemination of related information • Meteorological assistance to all the socio-economic sectors of Niger • Data collection, forecasting and dissemination • Promotion of meteorological research particularly in the area of global climate change and environmental protection • Monitoring of sub regional and international institutions dealing with meteorological information • Periodic circulation of elaborated data in meteorological bulletin format, agro-hydro-meteorological bulletins and year-books	• Member of the PPG (1st Vice President) and FSP steering committees • Chairman of the National Technical Commission on Climate Change, Resource institution during PPG for activities relating to meteorological information and the implementation of the UNFCCC • Responsible for the coordination and implementation of activities relating to production and circulation of meteorological information, and capacity building for the purpose of downscaling climatic information	• Outcomes 2&3
National Directorate of Land transport	• Information and data management relevant for inventory in transport sector • Implementation of mitigation programmes and projects	• Member of the PPG steering committees • Resource institution during PPG for providing data for transport equipments (vehicles, etc) when analyzing climate change scenarios	Output 2.1
Ministry of Finance and Economy	• Ensure choice and arbitrage of important investment • Contribute to the implementation of the UNFCCC through the GEF National Operational Focal Point	• Member of the PPG and FSP steering committees • Project endorsement on behalf of Niger Government • Monitoring of the project outcome in relation to the national policies and strategies	• Outcome 1, 2 and 3
Ministry of Mines and Energy	• Promote mitigation programmes • Develop new energy channels including renewable energy • Elaborate new regulatory	• Member of the PPG and FSP steering committees	• Outputs 1. 6, 2.2

Stakeholders	Attributions with respect to NAPA	Role in PPG and FSP	Specific Output Responsibilities
	framework aimed at developing and promoting energy efficiency and renewable energy sources		
Interministerial Steering Committee of Rural Development Strategy	• Ensure internalization and ownership of RDS by the various stakeholders • Define measurable objectives and resources for the implementation of the RDS (Action Plan) • Coordinate the recruitment of necessary resources for the implementation of the RDS • Ensure consultation with all stakeholders during the implementation of the RDS • Ensure consistency in the implementation of RDS programmes • Propose to Government appropriate legislative and legal measures to facilitate the implementation of RDS • Ensure that the Monitoring and Evaluation of the RDS is achieved and the results are taken into account in the implementation of the RDS	• Mandate the RDS Executive Secretariat to monitor the PPG and FSP implementation	Outcomes 1, 2 and 3
National Council of Environment for Sustainable Development	• Define referential framework including policy, orientations, objectives and programmes in the environmental sector for sustainable development • Favour the implementation of adequate institutional mechanisms ensuring coordination of activities of all stakeholders intervening in National Programme for Environment and Sustainable Development (PNEDD) • Ensure respect of national and international environmental standards in all developmental, social and cultural activities • Mobilize necessary financial resources for the implementation of PNEDD and ensure their adequate utilization • Promote a change of attitude for the sustainable use of natural resources and to ensure sound environmental management	• Member of the Steering Committee Meeting during the PPG and FSP • Nomination of the PPG and FSP Project Director and provision of facilities (including buildings) to the project Coordination Unit	• Output 2.1, 2.2, 2.3 and 3.1

Stakeholders	Attributions with respect to NAPA	Role in PPG and FSP	Specific Output Responsibilities
Early Warning System Coordination Unit	• Monitor and evaluate food, health, socio-economic crisis situations • Inform stakeholders on monthly and annual basis of the situation through the distribution of annual and periodic bulletins	• Member of the Steering Committee Meeting during the PPG and FSP • Will be the resource institution monitoring and providing information on eventual crisis	• Output 2.1, 3.1
Food Crisis Management Body	• Ensure coordination and supervision of crisis and natural disaster mitigation activities • Suggest measures to prevent and mitigate crisis	• Member of the Steering Committee Meeting during the PPG and FSP • Will be the resource institution monitoring and providing information on the eventual crisis	• Output 2.1, 3.1
High Commission of the Management of River Niger Valley	• Contribute to River Niger ecosystem regeneration and preservation • Contribute to the availability of water resources for different socio-economic usages • Improve food security issues and create alternative livelihoods of the population bordering river Niger • Contribute to the improvement of energy security of the country	• Partnership during the FSP : data provision on river Niger and irrigation possibilities	• Outcome 1
University of Niamey	• Ensure academic training of technicians in the rural sector • Training of researchers • Ensure training of workers for technical and scientific activities • Launch of fundamental and applied research activities	• Member of the Steering Committee Meeting during the PPG and FSP • Technical backstopping during PPG implementation • Collaborative research activities on the drought resistant varieties during the FSP • Provision of training during the FSP	• Outcomes 1, 2 and 3
National Institute of Agronomic Research of Niger	• Define and develop natural resources management technologies related to agriculture • Ensure the improvement of plant and animal production • Promote research and biotechnology development benefiting agriculture, livestock rearing and forestry sectors • Coordinate all the agronomic research • Training of agricultural producers	• Member of the Steering Committee Meeting during the PPG and FSP • Collaboration in Research and monitoring activities on the drought-resistant varieties during the FSP • Provision of training during the FSP • Provision of seeds of drought-resistant species and training to local stakeholders	• Outcomes 1, 2 and 3
National Centre of Solar Energy	• Carry out research on renewable energy such as solar power and ensure the dissemination of the results	• Ensure technical backstopping in the identification and supply of modern energy services to	• Outputs 1.6, 2.2

Stakeholders	Attributions with respect to NAPA	Role in PPG and FSP	Specific Output Responsibilities
	• Participate in carrying out prospective and diagnostic studies in the field of renewable energy utilization • Participate in the training on renewable energies and participate to the diffusion of renewable energy equipments.	rural areas	
AGRHYMET Regional Centre	• Train the officials of sahelian countries and others • Ensure agricultural, meteorological and hydrological monitoring at a regional level • Manage regional data banks • Ensure the management and circulation of information on natural resource monitoring in the Sahel • Capacity strengthening through training, research and systematic observation as well as the dissemination of information in the fields of agriculture, climatology, hydrology, and plant protection • Strengthen inter-country cooperation by the exchange of methodology and technologies.	• Member of the Steering Committee Meeting during the PPG and FSP • Technical information and support during PPG implementation • Collaboration in research, climate change risk management and monitoring activities on the drought-resistant crop varieties during the FSP • Provision of training during the FSP • Provision of data and information on the agro-sylvo-pastoral and meteorological situations • Provision of seeds of drought-resistant species and training to local stakeholders	• Outcomes 1, 2 and 3
African Centre of meteorological applications for Development (ACMAD)	• Develop and transfer technology tools to national meteorological systems • Production of information and meteorological and climatic products to favour sustainable development • Transmit meteorological and climatic information to users in rural areas	• Member of the Steering Committee Meeting during the PPG and FSP • Technical information and support during PPG implementation • Collaboration in Research, climate change risk management and monitoring activities especially concerning weather forecasting during the FSP • Provision of training during the FSP • Provision of data and information on the agro-sylvo-pastoral and meteorological situations • Provision of seeds of drought-resistant species and training to local stakeholders	• Outcomes 1, 2 and 3
National Geographical Institute of Niger (IGNN)	• Produce and diffuse information relevant to its field	• Providing maps during the FSP	• Outcome 1, 2 and 3

Stakeholders	Attributions with respect to NAPA	Role in PPG and FSP	Specific Output Responsibilities
Research Institute for Development	• Ensure diffusion of scientific and technical information to appropriate partners. • Develop activities in partnership with Niger institutions including, UAM, INRAN, DRE and DMN, and other regional structures such as ABN, AGRHYMET, ICRISAT and ACMAD • Strengthen capacity with training provided by national researchers to assist Niger's scientists' initiatives, research and systematic observation. • Disseminating scientific information in collaboration with IFTIC.	• Technical backstopping during PPG implementation • Research and monitoring activities concerning the drought-resistant varieties during the FSP • Provision of training during the FSP • Providing scientific data and information on soils and natural resources conditions and monitoring	• Outcomes 1, 2 and 3
Group local municipalities	• This group is composed of the Urban Communes (CU) and Rural Communes (CR). The local communities are concerned with the CC problem and particularly their responsibilities in the field of local management (Local development, transport, solid and liquid waste management, etc.).	• Member of the Steering Committee Meeting during FSP • Main responsible of activities identification during the PPG • Will be the local implementation partners in their respective communes • Responsible for the planning, implementation and monitoring of the project activities at communal level with the backstopping of the key ministries	• Outcomes 1, 2 and 3
Group civil society organisations	• Strengthen the capacities of ONG/AD members of eleven (11) groups and networks to ensure synergy of actions and efficiency of actions in the field of combating desertification and environmental protection, such as the implementation of PAN/LCD/GRN. • Contribute to the process of decentralization in the implementation of three conventions (CCD, CDB et CCNUC) • Contribute to the implementation of projects concerning mitigation measures on production of GES and adaptation to the negative effects of climatic change.	• Member of the Steering Committee Meeting during the PPG and FSP • Local implementation partners of the project	•

Stakeholders	Attributions with respect to NAPA	Role in PPG and FSP	Specific Output Responsibilities
Group of societies and private companies (Sonichar, Sonidep, Nigélec, Somaïr, Cominak, UNILEVER, BRANIGER, SNC, PROMOUSSE, etc.	• Production of electrical energy • Possession of data in the sector of electrical energy and mines • Evaluate wastes and industrial pollutants potentially dangerous to climatic change.	• Subcontractors during the FSP implementation • Potential source of funds for socioeconomic activities at the local level	• Outcome1
UNDP	• GEF implementing Agency • Development activities • Capacity building • Partnership development	• Member of the steering committee during the PPG and FSP • GEF Agency • Technical backstopping • Financial support and co-financing • Partnership building • Additional resources mobilization	• Outcome 2, 3 and 1
Technical and Financial Partners (Projects, multi and Bilateral cooperation)	• Provide technical and/or financial support to countries for the implementation of development actions • Experience sharing and building of synergy	• Members of the Steering Committee during PPG and FSP • Co-financing during FSP • Synergy within the RDS framework	• Outcomes 1,2 and 3

ANNEXES

ANNEX A – Modelling Niger's climate

The MAGICC/SCENGEN model (Version 2.4, 2000) was used during the Niger NAPA process to model future climates at 13 meteorological stations across Niger (Table A1). Although studies have not been undertaken to determine effects of temperature increases on evapotranspiration and water supply, the net effects of the predicted climate changes from the MAGICC/SCENGEN model is likely to be one of considerable drying and reduced water availability in soils. This is because the predicted change in rainfall is negligible (a maximum mean monthly rainfall decrease of 0.5 mm and increase of 1.7 mm), whereas the predicted changes in mean monthly temperature (a maximum mean monthly increase of 1.9 ^{o}C) is considerable. The increase in temperature coupled with the predicted decrease in cloud cover (maximum of 2.2 Octas) will give rise to greatly increased rates of evapotranspiration.

Table 16: Predicted changes in mean monthly rainfall (mm), temperature (^{o}C) and cloud cover (Octas) between the period 1961-1990 and the year 2025 at meteorological stations in Niger. Data was generated by the MAGICC/SCENGEN model (Version 2.4, 2000).

Stations	Rainfall	Temperature	Cloud cover
Tillabéri	-0.2	0.2	-0.7
Niamey	-0.5	0.7	-0.6
Dosso	1	0.6	
Konni	0.7	0.6	-1.6
Tahoua	0.6	0.3	-1.5
Maradi	0.9	1.9	-1.4
Agadez	0.3	0.6	-2.1
Zinder	1.4	0.4	-2.2
Gouré	1		-1.6
Mainé	1.3	0.6	-1.7
Magaria	1.7	1.4	-1.8
N'guigmi	0.8	0.8	-2
Diffa	1.1		
Bilma	0	-0.2	-2.3
Gaya	1.3	-0.6	0

ANNEX B – The socio-economic consequences of variable climatic factors on agricultural and livestock yields.

Table 17: The socio-economic consequences of variable climatic factors on agricultural and livestock yields

Livestock Sector	Agricultural Sector
Reduction in rural income streams.	A general food deficit that triggers famine or, at least, perpetual food insecurity.
Significant changes in the composition of livestock through a gradual replacement of the bovine population by small ruminants and camels.	Exacerbation of land conflicts.
The spread of malnutrition though the Niger population.	Rural exodus leading to increased settlement in towns which is likely to further incidents of crime, prostitution, begging, robbery and banditry.
Transformation of nomads into settlers, thus reducing farming lands and creating conflicts within host communities.	Deepening of rural poverty.
An increase in the import of milk products.	Reduction of the agricultural input to the GDP.
A reduction of the livestock input to the GDP.	

ANNEX C – Regulations which directly or indirectly relate to the water sector in Niger

- Ordinance N° 93-015 dated 2 March, 1993 spelling out the guidelines of the *Code Rural* [Rural Code] which aims at compiling all relevant regulations in a one Code around the following themes: ensuring land security for rural producers; natural resources conservation and management; organization of rural communities and land-use planning
- Ordinance N° 93-13 dated 2 March, 1993 on sanitation
- Ordinance N° 93-16 dated 2 March, 1993 on Mining Act
- Law N° 98-042 dated 7 December 1998 on fishing regime
- Law N° 98-56 dated 29 December 1998 on Policy law relating to environmental management
- Law N° 2000-12 dated 12 August, 2000 reorganizing water production, transportation and distribution activities in the urban water supply sub-sector and establishing the SPEN and SEEN.

ANNEX D – The association between water resources and agricultural and pastoral practices.

Water and agriculture

Agriculture employs more than 80 % of the labour force in Niger and involves a surface area estimated at 15 million ha which represents 12% of the total surface area of the country (1,267,000 km^2).

Although figures are not available, it is known that recurrent droughts (1964, 1974, and 1984) have had a devastating impact on agricultural production. As a result, food shortages are common. Production remains strongly dependent on rainfall as there is little revenue available for investment into irrigation practises. Population growth (currently 3.3% per annum) coupled with land degradation exacerbates food insecurity.

Water and crop cultivation

Areas sown with rainfed crops are estimated to be 8 million ha. Throughout Niger agricultural practices are quite rudimentary. They are characterized by little fertilizer input and the quick expansion of agricultural lands at the expense of rangelands, which now only cover marginal lands and semi-arid shrubby forests, some of which have disappeared.

Under these circumstances irrigation becomes a viable alternative to address natural constraints because it makes it possible to intensify agricultural activities which will contribute to improving food security. Irrigated farming is developing but it is, at present, practiced on a small-scale. The size of irrigated plots along the Niger River ranges from 0.25 to 0.5 ha per household. The exploitation of these small plots is not profitable. Expansion of irrigated farming is hindered by inefficient water management by users and poor infrastructure maintenance.

Increasingly communities are using water and soil conservation, protection and rehabilitation techniques to harvest runoff water. These methods are currently used over 500,000 ha to produce rainfed crops. Rainwater harvesting is used to reclaim lands and to increase yields through anti-erosion and agroforestry techniques. Developed lands for the purpose of irrigation are estimated at 100,000 ha out of 270,000 ha that are amenable to development. Although figures are not available, small-scale irrigation using shallow wells, hand-dug wells and ponds seems to be more widespread.

Regarding large-scale irrigation, as at 2007, there were 23,393 ha of developed land nationwide, 13,742 of which were used for production. Along the Niger Valley alone, there were 16,805 ha of developed lands, 7,767 of which were under cultivation. These lands are either located in basins or developed in the form of terraces. The others are essentially found in the Agadez oasis (125 ha of land is developed and under cultivation), in the Komadougou Yobé Valley and in bed of Lake Chad (1,742 ha developed, 1,402 ha exploited), in Goulbi Maradi valley (500 ha developed, 530 ha exploited) and in Adder- Doutchi- Maggia (4,250 ha developed, 3,917 ha exploited).

Until the early 1970's agricultural production had been over target but by the end of the 1980's only 86% of food needs were met. Nowadays, agricultural production is in deficit mainly as a result of droughts. It was noticed that the crop production was particularly negative from 1989 to 1996.

Floods, too, negatively affect agriculture. For the year 1998, for example, about 588 ha of rice fields, 8608 ha of millet fields and 203 orchards were damaged in Niger. It is evident that floods, too, constitute a threat to agricultural productivity.

Water and pastoral farming

The growth rate of animal production, essentially live cattle, meat, hides and skins was quite low (2.8% on average) and erratic (between 0.7% and 4.68%) over the 2001- 2005 period. The share of the livestock sector in the GDP was 9.6% on average.

The national livestock is made up of cattle, sheep, goats, camels, horses and donkeys. In terms of quantity and quality, the production potential of this sector is promising, especially with regard to small ruminants. Animal husbandry systems range from extensive to semi-extensive and essentially rely on natural rangelands as the major source of animal feed. The increase in the size of herds and the pressure they exert on natural resources exacerbate conflicts between pastoralists and farmers.

Providing water for animal consumption in Niger is problematic in the pastoral and intermediary zones (north of the 300mm/year isohyet) and in the agricultural zone with a high sedentary population. In the pastoral zone, and during the rainy season, groundwater-tapping points are complemented by numerous temporary ponds. Together, these water sources can not only cover the need of local herds but also that of the important livestock coming from the agricultural zone for the rainy season salt cure. Thus, in the pastoral zone, the problem is to provide water to animals during the dry season that lasts nine months.

The planning and programming of a water supply for animals is taking place in an unstable and ever-changing context thus leading to poor management of rangelands. This situation, which concerns an area of 227 000 km², changes from one year to another and results in the fluctuation of the number of cattle in need of water.

In addition, supplying water to livestock poses a serious problem because of the poor network and insufficient number of water points, difficulties in collecting water in areas where aquifers are reachable only at a great depth (over 60 m), a decrease in the level of the water table and an inadequate contribution by pastoralists towards the maintenance of the infrastructure built by the GON.

ANNEX E – Details of the rangelands management mandate.

At a national level, the Committee in charge of Rural Code comprises ministries involved in natural resources management (NRM) and land issues. The mandates include:

- definition of land policy
- implementation of land policy
    - support provision to the body in charge of implementing Rural Code (Land Commission);
    - assistance in drafting legal texts;
    - coordination of partners interventions;
    - monitoring and evaluation of the process.

At the regional level, the mandate of the permanent secretariat includes:

- design of Land development plan (SAF);
- contribution to the drafting of the SAF in line with the land development policy;
- regional consultation on Rural Code;
- support provision to COFOs at department and communal levels.

At the departmental level, the mandate of COFO/DEP includes:

- support provision to communal and village COFOs;
- coordination COFO/COM;
- establishment and monitoring COFO/COM and COFO/BASE;
- advisory assistance to stakeholders.

At the communal level, COFO /COM is responsible for:

- consulting with communities;
- clarifying the statutes and rules governing the use of land and natural resources;
- keeping COFO/DEP records at village;
- supporting COFO/BASE.

At the village level, COFO/BASE is in charge of:

- ensuring land security at village level;
- involving rural stakeholders in the drafting of transactions documents;
- identifying shared resources;
- monitoring land development.

ANNEX F – Drought-adapted agricultural and forage species.

Table 18: The drought-adapted agricultural and forage species requested by regions in Niger

	Adapted agricultural crops			Forage Species
Region	**Millet**	**Sorghum**	**Beans**	**Species**
Diffa	Dan Arba in (40 Days)	NAD 1	Dan Arba in TN5-78 27-80	Graminae[40]
Zinder	Ankoutes Ba Angouré	Lala (red sorghum) NAD 1	Sa baba sata TN5-78	Graminae Kalaho
Maradi	Ankoutes Ba Angouré HKP Guerguera	NAD 1 Mota Maradi	KVX Dan Zafi Oloka (FAO) Red beans	Graminae Tsintsiya Gadagui Farin Haki
Tahoua	HKP Ankoutes Guerguera H810GP	Mota NAD 1	Dan Zafi KVX 30-309-6G	Graminae Tsintsiya Gadagui Farin Haki
Agadez				Graminae Tsintsiya Gadagui Farin Haki
Tillaberi	HKP	Mota Red Sorghum	Dan louma TN5-78	Graminae
Dosso	HKP Zatib Sossate	Sepon 82 Mota Maradi	TN5-78 KVX IT89	Graminae

[40] 'Karanguiya' in haoussa language.

ANNEX G – Cereal and fodder banks

Fodder Banks

In Niger, cattle breeding and agriculture represent the main economic activities. The majority of the population are either farmers or pastoralists or both. However, the cattle breeding activity is seriously affected by the decrease of fodder production and the reduction of pastoral areas as a result of climatic events. This situation leads to a high mortality rate amongst livestock resulting in a shortage of animal products and, consequently, the populations' impoverishment and malnutrition amongst the most vulnerable groups. Fodder banks contribute to the improvement of the living conditions of the local population through increasing animal productivity. They do this by ensuring the permanent supply of livestock food supplements and thus, alleviate fodder shortages.

Cereal Banks

The NAPA process revealed that Niger has been experiencing recurrent cereal deficits for some decades, largely due to climatic factors. These deficits result in food insecurity in rural areas where more than 80% of the population depend on agriculture. This food insecurity mainly affects the most vulnerable groups in the population, especially women and children. To cope with this situation, communities turn to famine foods (picking fruit and leaves), sell households assets, cut and sell green wood, etc. for survival. Establishing or strengthening cereal banks is a recommended activity to help vulnerable communities cope with production deficits.

Taking stock of cereal banks in Niger

Background

Since the colonial era, one of the major concerns of Governments in the Sahel, in general, and in Niger in particular, has been to ensure food security for their population and combat cereal speculation. The severe impacts of climatic hazards on both people and animal food sources and reserves led colonial authorities to establish as early as 1910 a food security system, based on "reserve granaries" and the "*Sociétés indigènes de prévoyance"* (welfare system for local communities), SIP, all over French West Africa. Membership to SIP was mandatory for local communities, pursuant to a 1915 decree. These SIPs did not achieve their objectives, that is, ensuring food security and controlling cereal prices; they also became unpopular because people were forced to contribute part of their harvest to the SIP stocks. This system was dropped after independence. Public companies were established following the droughts of the 1970s. Institutional reforms conducted in these companies resulted in the establishment of a viable food security system involving beneficiary communities. This is how the concept of a "cereal bank" came to exist[41].

Cereal banks distribution in Niger

The findings of a survey undertaken by the Ministry of Agricultural Development show that there are 3,987 cereal banks in Niger unevenly distributed among the different regions of the country. They are concentrated in the regions of Tillabéri, Tahoua, Zinder and Maradi with 24.8%; 21.6%; 17.6% and 15.7% respectively (Table G1).

Table 19: Number of CB per Region

Regions	Agadez	Diffa	Dosso	Maradi	Tahoua	Tillabéri	Zinder	Niamey	**Total**
Number of CB	147	273	365	626	863	990	696	27	**3.987**
%	3.7	6.8	9.2	15.7	21.6	24.8	17.5	0,7	**100**

Source : MDA, 2006

[41] Afrique Verte Niger 2006. http://www.afriqueverte.org

According to this same survey, most of these cereal banks are located in villages facing food deficits, at least at the time these structures were established. More than 86 % of cereal banks are in administrative villages and more than 8% in hamlets, effectively more than 94% in sedentary areas and 5.5% in nomadic settlements.

Strengths and weaknesses of cereal banks

The 2006 survey conducted by the Ministry of Agricultural development on cereal banks revealed several difficulties as reported by cereal bank management committee members. These include:

- inadequate training of committee members and poor monitoring of cereal bank activities;
- lack or even unavailability of equipment;
- inadequate supply;
- low rate of loan recovery;
- poor stock management;
- irregular holding of meetings;
- inadequate stocks

Strengths of cereal banks:

In spite of the above-mentioned difficulties, cereals banks have several strong points as reported by a survey conducted by *Afrique verte Niger* (a NGO). These include:

- local communities are fully aware that food insecurity is a major challenge;
- communities recognize the relevance of cereal banks as a tool for combating food insecurity;
- women are eager to be involved in the cereal banks management.

Weaknesses of cereal banks

Weaknesses of cereal banks are of two types: internal weaknesses and those related to intervention context.

Internal weaknesses include:

- malfunction of the bank management bodies;
- lack of record keeping on management and administration;
- no legal status for community cereal banks;
- high literacy rates among the management committee members;
- non-compliance with the normal restocking frequency;
- poor loan recovery.

Weaknesses related to the intervention context:

- inadequate training of beneficiaries before establishing cereal banks;
- lack of appropriate storage facilities and storage equipment; storage practices in some banks;
- inadequate initial stocks because they are not based on any objectives criteria;
- inadequate monitoring;
- inadequate training provided to management committee members.

ANNEX H – Executive summaries of the Niger National consultant's reports

Executive Summary: "Additional information in relation to NAPA results" February 08

This document is aimed at providing information concerning issues related to water resources, agriculture, natural resources development and conservation activities additional to that provided in the Niger NAPA.

I. WATER RESOURCES

Water in Niger is found from different sources, many of which have their limitations. Aquifers are exploited by drilling wells and wells; alluvial aquifers are highly vulnerable to the effects of climate change and in deeper aquifers, electricity is required to reach the depth necessary. Wells in some regions (i.e. Diffa region) are at risk of silting up while in others (i.e. Dossa region) there is a high mineral content and sodium chloride component (> 1000 mg/l) and consequently this water may be unfit for human consumption. Gas emissions coupled with high fluoride content in water in the Dakoro region also act as constraints to the exploitation of groundwater resources.

Of the larger water bodies there is the Komaduga River, Lake Chad and the Niger River. The Komaduga River is seasonal and forms a border with Nigeria. Its annual flow is 500 million m^3. Lake Chad has shrunk to almost a tenth of its former size and has almost entirely receded from Niger. The Niger River is the only permanent watercourse in Niger, the average inter-annual flow is between 22.21 billion m^3 and 21.5 billion m^3. However, silting of the riverbed and invasion of aquatic and riverine weeds has significantly reduced flow in recent years. The construction of small dams and, possibly, permanent ponds remain the best ways to harness water. Protective measures against evaporation (wind breaks) and silting (including removal of invasive weeds) must be explored in an effort to reduce water loss. There are also numerous water bodies, mainly comprising permanent and semi-permanent ponds as well as a number of dams near the Niger River - all of which also face silting problems which is likely to reduce their potential over the coming years.

Water Resources Management

Policy Framework

In 2003, the GON adopted a RDS which was later revised in 2006. As a component of the Fast Track Development and SDRP it involves 14 programmes. Four of these programmes are directly related to water resource management.

Niger's National Water and Sanitation Policy: the relevant aims of the policy include:

- knowledge and control of water resources;
- improved coverage of both human and animal water requirements and expansion of irrigated lands;
- improved infrastructure management;
- protection of water resources and aquatic ecosystems;
- development of water resources based on improved sector organisation.

Legislative framework

In Niger, water resource use and protection is governed by the provisions of an ordinance (1993), revised (1998) to take into account the recommendations of the Dublin and Rio conferences. Aside from WHO guidelines, there are no national norms regarding drinking water or waste-water discharge in Niger. There are a number of regulations which relate to the water sector, but some date as far back as 1993 and require revision.

Institutional framework

Stakeholders' roles

Under Niger's new water policy, the GON and its agencies are responsible for designing, developing and implementing the national water and sanitation policies. They are also in charge of preventing and controlling pollution.

Social framework

Water infrastructure construction or rehabilitation projects are implemented using a participatory approach that empowers beneficiary communities through their full involvement in the design, construction and management of these facilities. The water resources technical department must pledge to maintain the facility. A national guide for conducting village water supply programmes was adopted in 1989 and revised in 1992, and probably needs further revision. Relevant statistical data came from the Master Plan for Development and Management of Water Resources of 1997 and also warrants revision.

Current and future use of water resources in general, and Niger River water resources in particular

Agriculture

Agriculture employs more than 80 % of the labour force in Niger and involves around 15 million ha of land, representing 12 % of the total surface area of Niger. Major cereals comprise millet, sorghum, maize and cowpea. Recurrent droughts (1964, 1974 and 1984) have a marked impact on rain-dependent agriculture (8 million ha) and food shortages are common.

Agricultural practises are generally rudimentary, characterized by low fertilizer use and rapid expansion of agricultural lands at the expense of rangelands. Irrigated farming is developing but is only practised on a small-scale (23 393 ha, 13 742 of which are used for production). Expansion of such farming is hindered by inefficient water management by users and poor infrastructure maintenance. Communities are increasingly using water and soil conservation and rehabilitation techniques to harvest run-off water (500 000 ha to produce rain-fed crops). Rain water harvesting is also used to reclaim lands and increase yields through anti-erosion and agro-forestry techniques.

Livestock

The livestock sector (mainly cattle, sheep, goats, camels, horses and donkeys) contributes 9.6 %, on average, to the GDP. Animal husbandry systems range from extensive to semi-extensive and rely on natural rangelands for animal feed. The increase in the herd size and the pressure they exert on natural resources is cause for conflict between pastoralists and farmers.

The planning and programming of water supply to livestock is inadequate, leading to poor rangeland management. In addition, supplying water to livestock is problematic as a result of the poor network of water points, difficulties in collecting water from deep aquifers, low water table levels and the inadequate contribution of pastoralists towards infrastructure maintenance.

Drinking water and sanitation

The criteria for provision of modern water points, according to the village water supply policy, includes supplying each administrative village with a modern water point (which can supply 250 people). Those villages with fewer than 250 km and more than 4 km from a water point also qualify.

Simple systems supplying water to villages with more than 2 000 inhabitants and powered by solar or thermal energy have proven to be satisfactory and the same is planned for villages with less than 1500 inhabitants. From 2000 to 2006, 10 546 modern water points were constructed. During this time coverage rates in the rural areas increased from 51.1 % to 58 %. Similarly, coverage rates increased in the urban settlements from 64.6 % to 68.2 % over the same period.

Pastoral areas need to be supplied with water during the dry season, which lasts nine months. The only available exhaustive inventory of water points (modern and traditional) in the pastoral area was conducted in 1970 and needs review. According to this inventory there were 3 348 water sources, 2 596 of which can be used for livestock drinking. The remaining water points were noted to be traditional and unreliable. These remaining water points include semi-permanent water points, which rely on rainfall and hence, often cease to exist during drought periods. This erratic nature of certain water points is known to promote population migration.

Niger undertook to improve hygiene and sanitation conditions of its population in the early 1980s, in compliance with the International Drinking Water Supply and Sanitation Decade (IDWSSD). The coverage rate of improved sanitation systems is only 5 % in rural areas. With the assistance of bilateral and multilateral cooperation agencies (WHO, UNICEF, World Bank etc) and some NGO's, the GON has initiated hygiene and sanitation projects in both rural and urban areas.

Fisheries

Over the period 2001-2005 the forest and fisheries sub-sector averaged 5.1 % of the GDP and recorded an average growth rate of 15.5 %. This can be attributed to renewed fishing activities in Lake Chad which returned to Niger after receding for many years. Fish production employs 50 000 people. This activity is likely to grow, with the gradual development of enhanced fisheries and reorganization of the sector.

Transport

The transport sector recorded an average growth rate of 8.2 % over 2000 – 2005. Its share in the GDP increased from 6.49 % to 7.25 %. Road transport represents the most important component of this sector.

Mines and industries

Major industries in Niger include: agro processing, textile, cement and chemical products. Despite its low growth rate (-0.68 % on average) recorded in the 2000-2005 period, the mining sector accounted for an average of 2.16 % of the GDP.

Environmental uses

Both the Niger River and Niger's portion of Lake Chad play a major role in the preservation of ecosystems and biological diversity. In addition, Niger has ten wetlands of international importance, listed as Ramsar sites.

Tourism

Tourism and water resources are closely related as rivers and lakes are tourist attractions. However, tourism facilities (hotels, restaurants) generally consume large quantities of water. A national Tourism Promotion Centre has been established to promote Niger as an international tourist destination.

Future use of Niger River water resources

The major planned use of the Niger River revolves around the Kandadji Programme for Ecosystem Regeneration and Niger River Development. The feasibility study for this programme has identified 122 000 ha of land with irrigation potential, 31 000 ha of which can be used for irrigating purposes, at an average rate of 1 000 ha per year.

Since 2002 the Niger Basin Authority (NBA) has developed a process known as 'The Shared Vision' for sustainable development in the Niger Basin. Furthermore, Heads of State and Government at the Paris Conference (April 2004) signed a historical agreement on 'the principles of good governance for

sustainable development in the Niger Basin'. NBA technical and financial partners agreed to support member states in this process.

II. DEVELOPMENT AND PROTECTION OF NATURAL RESOURCES

Studies conducted under NAPA (Sector Identification Report) indicate that there are eight sectors vulnerable to the adverse effects of climate change. Implementing water and soil conservation and rehabilitation activities will improve livelihoods of vulnerable communities in the following areas:

- Agro-sylvo-pastoral production: through improved access to the infrastructure, equipment and inputs needed for production for rural producers.
- Coverage of human and animal water demand: through drilling and rehabilitating modern water points.
- Health: through construction of health facilities and improved health coverage rate
- Natural resources protection and development: based on plantations of *Acacia senegal* promoting the gum arabic sector.

Technical services, national and international organisations endeavour to carry out a series of activities every growing season aimed at restoring and protecting the environment. Between 2000 and 2006 activities were carried out in the following areas: re-forestation, land restoration, agro-forestry, protection of natural re-generation, natural forest management, bush fire control.

Re-forestation, land restoration and agro-forestry

In the area of re-forestation and land restoration the objectives of the 2000-2004 Action Plan were to: reclaim 1 800 000 ha of degraded land, produce 30 million forest seedlings each year and re-forest 395 000 ha.

The strategy for the implementation of environmental policy and desertification control is focused on the following areas:

- Intensification of participatory re-forestation using species with economic value;
- Development of non-timber forest products, especially gum arabic, *Prosopis chilensis* seeds, neem seeds (pesticide production) etc.;
- Implementation of major water and soil conservation/soil protection and rehabilitation projects;
- Allocation of a substantial part of resources generated through the collection of taxes and fees to desertification control activities;
- Mobilisation of a large proportion of the population: women, youth, army and other organised forces for land reclamation activities.

During 2000-2006 64 796 973 seedlings of all forest species were produced with funding from Central Government (through *Programme Gommier*), local Governments, projects, NGO's and the private sector. Priority was given to local species, of which 70 % were gum species.

Over the 2000-2006 period the following achievements were recorded in the forestry sector:

- Block plantation involving 79 990.4 ha
- Linear plantation on 99 887.9 km (involving all species)
- Reclamation of 82 540.2 ha of land
- Stabilisation of 9 221.1 ha of dunes
- Agro-forestry activities covering 11 652.2 ha and improvement planting over 2 197.3 ha of forest areas

Land reclamation

Land reclamation has been addressed through the Special Programme of the President of the Republic. Specific objectives of this programme include:

- To reverse the trend of land degradation in catchment basins, watercourses and bodies

- To protect the agricultural lands in the Niger River, *Goulbi*, *Koroma* and *Dalloll* valleys, as well as those in the Manga oasis basin
- To protect pasturelands against bush fires
- To contribute to poverty reduction
- To reduce youth unemployment
- To control rural-urban, regional and international migrations

Achievements include reclamation of 7 534 ha of land; protection of 15 000 ha of productive lands, and downstream portions of basins; stabilization of 750 ha of dunes and protection of more than 1 000 ha land in basins and construction of 45 204 bunds

Assisted natural re-generation and agro-forestry

Major activities in this area include: planting on farmlands and other production sites and locating and protecting natural re-generation or assisted natural re-generation. According to the 1984-2004 *Sahel Niger* study report on 'the impacts of investments in natural resources management on food security, rural poverty and environment'; natural re-generation activities were conducted over three million ha of land (150 000 ha/year on average).

This resulted in:

- Conservation and improvement of soil fertility in an environment characterised by over-exploitation of agricultural lands and low fertilizer use
- Crop protection and erosion control
- Improved crop yields
- Use of timber and non-timber products by local communities to meet their needs
- Increased availability of firewood, thus reducing the time women spend collecting wood.

Development of natural forests

To date, more than 800 000 ha of natural forests are being managed through a network of about 290 rural wood markets. These activities were carried out mainly within the framework of the following projects:

- Second Energy Project and Household Energy Project funded by the Danish Cooperation
- *Borasus* stand local management support Programme funded by the Swiss Cooperation
- Natural Forest Management Project funded by the African Development Bank (AfBD).

These management activities have had many advantages, notably preventing agricultural activities from encroaching on forest areas. On the socio-economic level, village forest management help put into place a system for transferring financial resources to communities through selling of fuel wood and levying of taxes on wood transport.

Bush fire control

Over the 2000-2006 period several bush fires were reported nationwide, covering 337 650 ha and resulting in a significant loss of pastureland. Fire control measures included the establishment of more than 7 731 km of fire breaks and training of approximately 1 207 villagers in bush control measures.

Rangeland management

In its attempt to introduce a pastoral development model in agricultural zones, the GON designed a strategy aimed at ensuring land security. This strategy focuses on the design, demarcation and exploitation of rangelands and pastoral enclaves.

The strategy designed by the GON, and contained in the Niger Rural Code, recognises the need for pastoralists to have a guarantee as to the use of pastoral resources in their homelands and to be able to move their herds all over the country. The Rural Code (1993) provides for the establishment of a Land Commission in each region, department, site and village, chaired by the Governor, the prefect, the Mayor and the village chief of tribe leader. The commission is a consultative body but they decide on land development criteria (notably demarcation of rangelands), draft land tenure laws and grant land rights.

Pastoralists move northwards during the rainy season and southwards during the dry season in search of permanent water points. Such movements are regulated by separating farming zones from pastoral zones to prevent clashes between pastoralists and farmers.

II. MARKET MECHANISM, FOOD SECURITY AND POVERTY CONTROL

The PRSP

In spite of significant achievements in Niger, livelihood indicators remain low. If this current trend continues, Niger is unlikely to achieve the targets set forth within the framework of MDGs by 2015. Niger is consequently revising its Poverty Reduction Strategy (PRS) to a fast-track poverty reduction strategy (2008-2012 PSRP), in order to give a new impetus to its socio-economic development policy. Challenges to be tackled by the PRSP are in line, with those the NAPA intends to address. Furthermore, three of the four PRS priority programmes are in the NAPA's area of focus, reiterating that NAPA is in line with the objectives set forth in the fast-track Poverty Reduction Paper.

Agricultural and fodder species adapted to climatic conditions

Several legume and cereal varieties have been developed by stakeholders involved in plant breeding, specifically drought-adapted varieties. However, large-scale production of such varieties is hindered by a lack of technical skills among farmers; financial constraints facing rural producers and the disruption of the seed production sector. These factors need to be addressed in order to take advantage of such drought adapted varieties. This would also include the careful selection of species which will depend on environmental factors, development objectives and plant propagation methods.

System for sowing on rangelands

Since a great deal of effort is required before, during and after implementing rangeland improvement activities, these must be community-based activities and involve all grass-roots development stakeholders. There should be a community-driven participatory approach and the fodder species preference of the community should be taken into account. Furthermore, the environmental and socio-economic factors in each area need to be understood. To that effect, there is need to conduct studies aimed at characterizing the area.

Furthermore, this consultant's report provided information concerning cereal and fodder banks in Niger. The information uncovered is contained within annex G.

Diversification of livelihoods of farmers and pastoralists

Considering the destruction of their living conditions as a result of the adverse effects of climate change, farmers and pastoralists must seek alternatives to ensure their livelihoods. Farmers can engage in alternative income-generating activities such as animal fattening, petty trade, market gardening and credit and savings associations. Pastoralists should take part in similar income-generating activities whilst also better managing their cattle (especially via destocking).

Executive Summary: "Review and analysis of the legal framework, phases and rural development programme in Niger" April 2008

This summary focuses on 3 sections: review and analysis of the legal and regulatory framework of the rural sector; review and analysis of strategies, plans and programmes of the rural sector; review and analysis of investment programmes and projects in the rural sector

1. REVIEW AND ANALYSIS OF THE LEGAL FRAMEWORK RELATED TO RURAL DEVELOPMENT

1.1 The legal framework of the agriculture and livestock sectors

In Niger, many laws, ordinances and decrees govern the agriculture and livestock sectors. These may be presented in two groups: new texts established after the adoption of the constitution dated 9th August 1999 and those prior to the adoption of the constitution.

The analysis of the agricultural and livestock legal framework in Niger shows that there is legislation passed for the majority of cases involving these two sectors, however follow up and support text are required as well as revision of a number of texts.

1.2 The legal framework of the water resources sector

The study of the current legal system of water resource management shows inadequacies and the need to update it in order to adjust the national and international institutional context [ARM, CNE/A, decentralization, sector strategies (IWRM)]. There are also difficulties and problems in relation to other sector texts in that there are many contradictions between them. It is imperative that these are reviewed and details from specific texts be incorporated into general texts.

1.3 The legal framework of the Environment sector

There are more than 300 international conventions, around 900 treaties and 35 international agreements fully or partly devoted to the preservation and management of the environment. Niger has signed or ratified 34 of these conventions and agreements. The implementation of which is done inconsistently and it is necessary to include them into the texts (including the national texts).

2. REVIEW AND ANALYSIS OF STRATEGIES, PLANS AND PROGRAMMES OF RURAL DEVELOPMENT

2.1. Analysis of the RDS

The RDS is a sector report of the PRS and it is the only reference framework for the government to conduct activities in the rural sector. Its general objective is to reduce the impact of poverty from 66% to 52% by 2015, by establishing conditions of sustainable economic and social development that will ensure the population's food security and sustainable management of natural resources. It consists of three strategies:

- to make it easier for rural producers to get access to economic opportunities in order to create conditions for sustainable economic growth in the rural environment
- to prevent risks, improve the food security and sustainably manage natural resources in order to secure living conditions of the population
- to capacitate public institutions and organisations in order to improve the management of the rural sector.

2.1.3 National Strategy and Action Plan for Climatic Change and Variability (SNPA/CVC)

This strategy has been developed within the implementation of the United Nations Convention on Climate Change (CCNUCC). The agricultural–livestock sector occupies an important place in this strategy. It comprises the following:

- generalization and dissemination of technologies that favor the intensification of agriculture

and livestock
- diversification of agro-pastoral production systems
- improvement of land productivity by practicing relevant technologies
- improvement in training levels of the population
- reinforcement of information systems
- improvement of ongoing irrigation systems
- improvement of agro-pastoral production systems

2.2 Strategies, plans and programmes of the sub-sector of water resources

Niger's water policy depends largely on a number of international meetings and conventions. During the implementation of its DIEPA Program, Niger has re-defined its policy based on the right to water for all and the obligation of the beneficiaries to maintain their water points and infrastructure. Niger has developed in this framework many national policies and strategies.

The objective of this water management policy was:
- acquiring a better knowledge of water resources;
- control and optimum valuation of surface water resources and mobilization of underground water;
- development of water resource infrastructure with an emphasis on the construction of control structures or hill catchments for agricultural and/or energy purposes;
- setting up a management and maintenance system of hydraulic structures and water collection tools.

In line with the West African Water Vision, the Republic of Niger drafted a national plan in 2000. In 2004 they also drafted a document known as 'the Millennium water and sanitation goals' which summarises the sector and proposed objectives for the country to achieve the MDGs. The objective of MDG is to half the proportion of the population with no access to drinking water and sanitation by 2015.

Analysis of the Poverty Reduction Strategy Paper (PRSP) and Rural Development Strategy Paper (RDSP) shows that that the issue of water and sanitation ranks among the top priorities of the Government of Niger.

2.3 Strategies, plans and programmes at the sub-sector on the environment

In Niger, farmer and breeder communities face the following challenges:
- land degradation
- extensive decrease of natural resources productivity
- reduction of forest areas and biodiversity
- movement of sand dunes into farm lands and silting up of water ways
- development of weedy plants and various forms of pollution

The Government of Niger and its partners took various steps to address the above-mentioned challenges, through consultation in 2006. It was aimed at generating partners' support to the Mid-term Expenditure Framework (2006-2011 (MTEF)). The identification of MTEF sub-programmes results from an integrated development of strategies and action plans.

2.3.1 Accelerated Development and Poverty Reduction Strategy (SDRP)

According to SDRP, on the basis of its vision, Niger plans to protect at least 8% of its national terrestrial territory by 2015. To improve natural resources management, priority will be given to the establishment of local natural resources governance mechanisms to create conducive conditions for the adoption of a sustainable management approach and restoration of some degraded areas. The aim is essentially to guarantee rural communities access to land resources and prevent conflicts. Thus the

rural code, which is the relevant regulatory framework, will be finalized, disseminated and implemented countrywide.

2.3.2 The objectives of the RDS in Environment

The overall objective of RDS is to 'reduce the incidence of rural poverty from 66% to 52% by 2010, by promoting sustainable economic and social development, to ensure food security and sustainable natural resources management. Three key objectives include:

- reduce inconsistent access to food
- improve the nutritional quality of food
- create the necessary conditions for sustainable natural resources management

3. REVIEW AND ANALYSIS OF INVESTMENT PROGRAMMES AND RURAL DEVELOPMENT PROJECTS

3.1 Investment programmes and projects of the livestock and agriculture sectors

An inventory of programmes and projects in the agriculture and livestock sectors has been undertaken. Based on information collected on all ongoing and closed projects, 33 projects in the agricultural sector and 16 projects in the livestock area have been identified.

The investments of projects and programmes in the sector of agriculture had multiple outcomes among others:

- improvement of soil fertility
- reinforcement of professional and agro-pastoral organizations
- improvement of food security
- development of small irrigation

Executive Summary: "Review of the current and projected level of the climate change impact and technical and financial feasibility of the adaptation" May 2008

This report is divided into two sections: (1) the current and projected impact of climate change in Niger and (2) the technical and financial feasibility of proposed adaptive measures. This executive summary focuses primarily on section (2).

Section 1: Current and projected impact of climate change in Niger

Current vulnerability of water resources

- Niger has experienced a decline in rainfall during the past three decades and drought between 1968–1972;
- there is a corresponding rainfall deficit of 20 %, which can reach over 30 % in certain particularly dry areas;
- isohyets indicate that there is a clear southward movement of rainfall;
- consequences of the above include accelerated desertification, reduced crop production and a decline in the rural populations who are moving to the cities.

The consequences of rainfall variation on surface water:

- A decrease in river flow;
- Earlier onset of floods in Guinea each year.

Ground-water resources are inextricably linked to surface-water conditions and these are affected in two ways by climate change:

- qualitatively, through variation in mineral content;
- quantitatively, through the varying size of groundwater reserves.

Current vulnerability of the agricultural sector

Droughts and floods have adversely affected food stocks and crop yields, exacerbating food insecurity. Socio-economic impacts of climate factors on agriculture are characterized as having the following consequences:

- reduced agricultural yields;
- food deficits that generate famine or at least permanent food insecurity;
- aggravation of land conflicts;
- migration from rural areas to towns;
- deepening of rural poverty;
- reduction of the agricultural input in the GDP.

Current vulnerability of the livestock sector

As a result of livestock sensitivity to drought cycles, milk production has been reduced from 107 liters of milk/person/year to 30 liters milk/person/year – even with an external contribution estimated at 6 000 tons milk/year. Livestock numbers have been shown to drop by up to 50 % over serious drought periods in Niger.

The socio-economic impacts of the climate factors on the livestock sector are characterized by:

- a decrease in rural incomes;
- significant changes in the composition of cattle through a gradual replacement of bovine populations by small ruminants and camels (more drought-tolerant);
- malnutrition of the population;
- nomadic pastoralists becoming settlers, thus reducing available farmlands and causing conflicts within host communities;
- an increase in imports of milk products;
- a reduction of the livestock input in the GDP.

Current vulnerability of the forest sector

As a result of adverse anthropogenic factors intensified by climatic conditions, Niger's forest resources have been seriously degraded. The exploitation of natural resources remains the main survival and adaptation option of the local communities. The main human activities responsible for the forest degradation are:

- agricultural deforestation;
- uncontrolled exploitation for food, fuel and health needs;
- overgrazing;
- bush fires.

SECTION II: Adaptation Measures: Feasibility

1. Use and distribution of the seeds of drought-adapted species

There are six varieties of millet in Niger, three of which can survive within the 300 mm rainfall farming zone. There are two varieties of sorghum and there are four varieties of Niebé of which two are drought-resistant. The objectives of using drought resistant crops are to increase diversity, agricultural production, producers' income streams and to reinforce food security

1.2. Use of drought-adapted fodder species: rehabilitation of degraded lands

This is a technique of pastoral management which aims to combat undesirable plant species by improving pasture areas and corridors through the introduction of desirable and needed plant/herb varieties.

2. The construction and usage of cereal banks

A cereal bank is a storage system useful in times of drought and for food security. The objective of the implementation or rehabilitation of cereal banks is to improve the food supply of villages with perpetually deficient agricultural production (especially for zones with chronic cereal deficiency) due mainly to climatic constraints.

3. Implementation of water resources management

As a result of non-exploited water resources and available manpower, it is necessary to have a better knowledge concerning national water potential, including exploitation constraints and to improve on water-drawing systems in order to make water more available and at a reduced cost.

4. Water and Soil Conservation Measures – Soil Defence and Restoration

Measures discussed in this report come from the results of previous research conducted by various rural development organisations (NGOs, research institutions, technical services and producers). However, the ideas and objectives developed represent only part of the technical solution available to increase the agro-sylvo-pastoral production, reduce degradation and re-establish the state of ecosystems. The ideas do, however, have the advantage of being taken from people's experiences and innovations that are more often than not improved upon by the institutions, technical services, NGOs etc prevailing in the rural areas.

5. Biological means of soil protection

Biological means of soil protection can also be effectively implemented.

Executive Summary: "Selection criteria and proposal to adaptation activities in NAPA intervention zones" June 2008

The overall objective of this document is to define the selection criteria for the future activities of the projects in areas identified by NAPA and to propose solutions.

Adaptation criteria and measures are based on field studies and missions conducted during the process that resulted in the development of the NAPA framework document and climate variations.

The proposed adaptation measures and operational activities concern (i) the use of (agricultural and fodder) drought resistant seeds; (ii) the distribution process of adapted seeds; (iii) seed banks; (iv) the improvement of water resources management; (v) Water and Soil Conservation / Soils Defence and Restoration (CES/DRS); (vi) stabilization of sand dunes around agricultural and pastoral basins; (vii) pastoral landscape management and (viii) water supply.

Defined criteria and proposed activities to implement the adaptation measures

3.1 Common general criteria

Four general selection criteria (NAPA, Article 15) were used to prioritise adaptation measures from potential activities. They were:

- severity of the climate change effects
- poverty reduction in order to increase the adaptation capacity
- synergy with other multilateral agreements in the environment sector
- cost effectiveness ratio

In addition to the above, this study has also defined common general criteria to the adaptation measures that will be implemented:

- The sum total of the objectives of the proposed measure should be in line with the SDRP and SDR;
- The social acceptability as determined by the needs expressed by the population during site missions;
- The existence on site of the necessary technical training (technical services and NGOs) to support the implementation of the activity;
- Needs that are expressed by the population during site missions;
- Conformity with local realities and the socio-cultural environment of the site;
- Participation of the beneficiary populations;
- Proposal of low cost innovations and replicable solutions by the project;
- Beneficiarie's ability to raise additional resources;
- The contribution of the project to improve the life conditions of the targeted populations, particularly women;
- The location of the project in one of the most vulnerable areas of NAPA;
- Inputs from the various communities;
- Synergy possibilities with other projects or programmes.

As for the specific criteria and activities, they are developed in the following adaptation measures:

3.2 The use of (agricultural and fodder) drought resistant seeds

The proposal to gain acceptance/use of drought resistant seed types for agricultural purposes in selected sites of NAPA will take into account the following criteria:

- The vulnerability of the agricultural activities prior to climate change
- The population's ability to adapt to the negative effects of climate change
- The ecological conditions of the area and whether the selected area is appropriate for the seed types proposed

3.3 The distribution process of adapted species

The following criteria need to be checked before the rehabilitation of degraded landscapes via sowing of drought resistant seed types:

- The vulnerability of pastoralism to climate change results in recurrent fodder deficits
- The population's ability to adjust to the negative effects of climate change
- The ecosystem must be suitable for the seeds being introduced
- The level of land degradation of the designated area, i.e soil erosion, invasive plants present etc.
- Vegetation type
- Defining the ownership of the land to be developed, i.e. whether public or private land
- Plant physiology

When selecting a site, the following criteria should be taken into account:

- Sowing objectives
- Environmental conditions, i.e. climate (rainfall, temperature), soil type and work necessary to prepare the soil and /or collection of water
- Seed types to sow

- Utilisation of the type of plant species sown
- Soil micro-biological activity
- Protection and management rules of the developed site
- Land status of the site to be sowed
- Selection of the site through a participatory approach i.e. involvement of the beneficiary population at all stages of development

When deciding which type of seed to sow, the following criteria must be taken into account:

- Amount of fodder produced - a high yield of dry matter is required (kg MS/ha or Kg MS/work)
- Quality of the fodder produced (nutritional value: UF, MAD, minerals content)
- Suitability of the species to the ecological conditions of the environment
- Plant uses other than fodder
- Ability of the species to stabilise the soil and help combat soil erosion
- Drought resistance and the ability to propagate itself

3.4 Cereal banks

The selection of the area in which these adaptation measures will be implemented depends on the following criteria:

- The vulnerability of the food security of the population facing climate change results in recurrent cereal deficits
- Low capacity of cereals in markets to supply the cereal banks once established
- The organizational capacity of members to ensure good management of the cereal banks
- The involvement of at least fifty percent (50%) of women on the cereal bank management committees.

3.5 Water resources management

The proposed actions are based on the following criteria:

- Efficiency: the ratio between the cost of the proposed action and the number of beneficiaries
- Cost of water collection equipment
- Crop farming irrigation experience
- Water distribution experience

3.6 Safe drinking water supply

- One modern water point per 250 inhabitants
- One modern water point for each administrative village even though the population is less than 250 inhabitants providing the village is situated more than 4 km from a modern water point
- One water post for populations between 1,500 and 2,000 inhabitants
- One drinking water supply (AEP) for any village having more than 2,000 inhabitants
- Villagers will be responsible for the selection of the type of infrastructure, their financial participation and the setting up of a water point management committee
- Signing of a contract with the water resources technical service to show the communities commitment to maintaining the water point
- Capacity to contribute to the funding of the infrastructures

3.7 Water and land conservation and land defence and restoration

Criteria used to identify potential activities are as follows:

- Vulnerability of the ecosystems and population confronted with climate change
- Capacity of the population to adapt to the negative effects of climate change

- The ecological conditions of the area
- Silting of water courses
- Biological diversity
- Management of pastoral land and forests
- Food and agricultural security
- Environmental conditions: climate (rainfall, temperature), nature of the soil and soil preparation works and/or water collection
- Seed types to sow or plant
- The micro-biological activity of the soil
- Protection and management rules of the developed site
- The ownership status of the site to be sowed
- Selection of the site through the participatory approach: involvement of beneficiary populations at all the management steps
- Consideration of the ecological degradation level of the plots to be sowed (e.g. the erosion stage of the plots, and invasion by inappropriate species)

Annex I: Adaptation Learning Mechanism Templates

ADAPTATION LEARNING MECHANISM

Climate Change Adaptation Experience Template

Climate Change Adaptation Experiences help the adaptation community share practical experiences and lessons to promote learning. **Experiences may include: successful or unsuccessful practices, approaches, and strategies, lessons learned,** and **reviews of methods applied (e.g. screening tools, guidelines, etc.)**. *Templates also available: Adaptation Profile and Mainstreaming*

***Completed by:** ***E-mail:** ***Date:**

Completed forms may be up to 6 pages and should be submitted to info@adaptationlearning.net

1. **Experience Title –** *Please provide a title for the adaptation* ***experience***

   What is the initiative from which the experience is derived? (Include project code, if applicable)

2. **Initiative Description –** *Briefly summarize the initiative's objectives, methods, expected outcomes, timeframe, and specific activities of relevance to the experience.*

3. **Adaptation Experience Description: Challenge(s), Solution(s) –** *Describe 1) the adaptation challenge(s) or question(s); and 2) how the challenge(s) was (were) solved and/or the question(s) addressed through specific actions.*

4. **Results and Learning** *– Describe the impacts of this experience on the problem, the project and stakeholders and partners, as well as what was learned about "(good) adaptation practice"?*

5. **Replication –** *What conditions should be in place or efforts made to replicate the successes (and overcome challenges) of this experience? What should others expect when replicating this experience?*

6. **Significance –** *What is the significance of this experience: How is it innovative and what is the potential relevance? Who else should be interested?*

ADAPTATION LEARNING MECHANISM

7. **References –** *How can more information be obtained? Please provide relevant Web site(s), documentation and contact information. These may be shared through the ALM.*

8. **Keywords** – *Please provide up to 6 keywords to help others search for and find this experience.*

1. 2.	3. 4.	5. 6.

9. **Photos** – *Please attach photos with this note or share the link to photos online*
