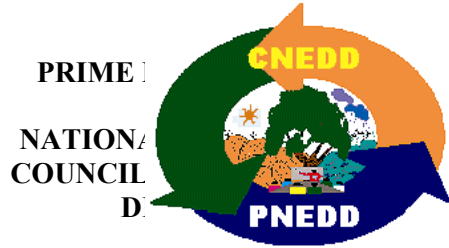




REPUBLIC OF NIGER



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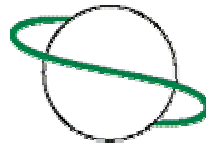
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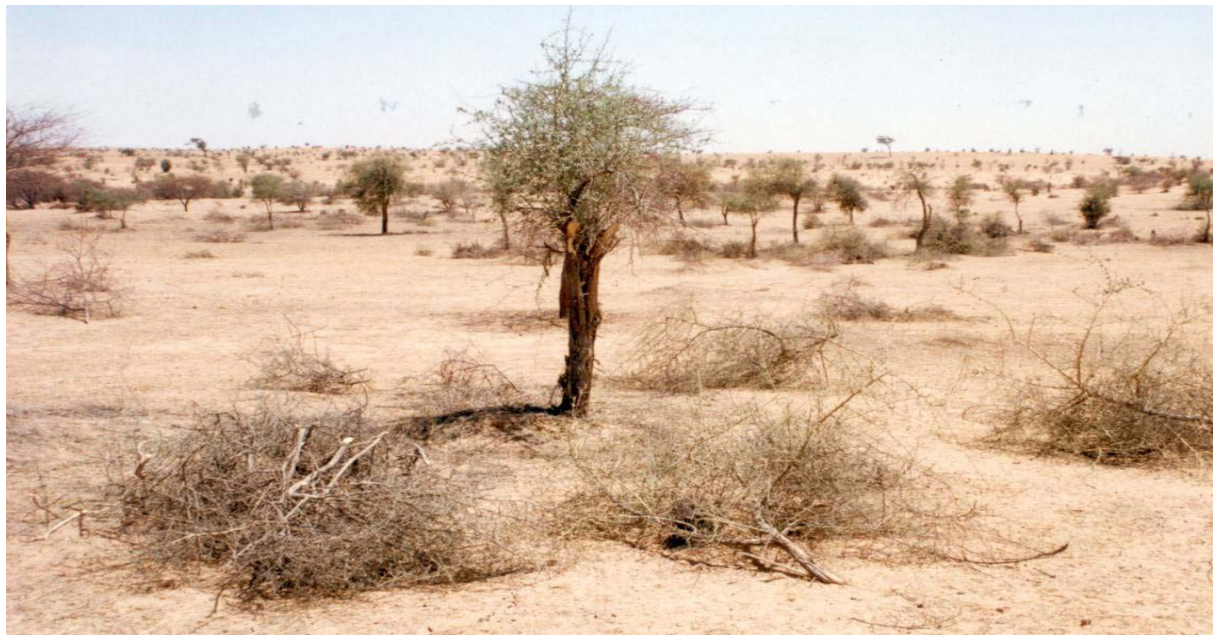
UNITED NATIONS
DEVELOPMENT
PROGRAMME



GEF



UNDP



NATIONAL ADAPTATION PROGRAMME OF ACTION

August 2006

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FOREWORD

The present document elaborated by the National Environmental Council for Sustainable Development is the National Adaptation Programme of Action (NAPA) to adverse effects of Climate Changes (CC). Its elaboration falls within the scope of the implementation of the National Strategy and Action Plan for Climate Changes and Variability (SNPA/CVC) elaborated in April 2003 and adopted in March 2004. This strategy is within the scope of the climate variability and changes, one of the six (6) priority programmes of the National Environmental Plan for a Sustainable Development (PNEDD).

The elaboration and implementation of the NAPA in Niger is also in the line with the United Nations Convention on climate changes (UNFCCC) that Niger signed and ratified respectively on July 11th, 1992 and July 25th, 1995.

Niger set up the National Technical Committee on Climate Changes and variability (CNCVC) in July 1997. The country subsequently elaborated its Initial National Communication (CNI), which was presented at the sixth Conference of the Parties in November 2000 at the Hague (Netherlands).

The preparation of the NAPA also comes within the framework of the 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 NAPA and 29/ CP7: setting up of the Least Developed Countries (LDC) Experts Group.

Niger got a financial support from the Global Environment Fund (GEF) to elaborate its NAPA.

The development objective of the NAPA is to contribute to lessen the adverse effects of climate on the most vulnerable populations with the prospect of a sustainable development and fight against poverty in Niger.

The Niger NAPA document gives an overview on the content of priority activities to be undertaken to face urgent and immediate needs and concerns for the purpose of adaptation to adverse effects of climate changes.

This document represents a general dynamic and flexible framework aiming at directing and coordinating priority activities relating to adaptation to climate changes in the country on the basis of strict criteria and through a participatory and synergetic approach involving the different stakeholders, particularly the local communities, public sector, private sector, NGOs and Civil Society as well as other National programmes, mainly the Rural Development Strategy (SDR) and the Poverty Reduction Strategy (PRS).

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ACRONYMS

ACMAD: African Center of Meteorological Application on Development

MEA: Multilateral Environmental Agreements

BAB: Livestock Food Bank

UNCCD: United Nations Convention to Combat Desertification

UNFCCC: United Nations Framework Convention on Climate Changes

CBD: Convention on Biological Diversity

CERMES: Center for Medical and Health Studies and Research

CES/DRS: Water and Soil Conservation/ Soil protection and restoration

CG: Management Committee

CNEDD: National Environmental Council for a Sustainable Development

CNI: Initial National Communication

COGERAT: Joint Management of the Aïr and Ténéré Reserve

CUN: Urban Community of Niamey

LUCOP: Fight Against Poverty

PAC: Community Policies Programme

PACE: Pan African Project for Fight against Epizootic Diseases

PADAZ: Project of support for Agricultural Development in Zinder

PADL: Project of support for Local Development

PAFN: Natural Forests Management Project

COP: Conference of the Parties

PAGRN: Project of Support for Natural Resources Management

CP: Running Committee

CVD: Village Development Committee

ENDA-TM: Environmental Development Action in the third world

GEF: Global Environment Facility

FLCDRPS: Fund to Combat Desertification and for the Reduction of Poverty in the Sahel

IHD: Index of Human Development

IEC: Information/ Education/ Communication

INS/MF/E: National Institute of Statistics / Ministry of Finance and Economy

LEG: Least Developed Countries' Experts Group

MAGICC/SCENGEN : Model for the Assessment of Greenhouse-gas Induced Climate Change/ SCENario GENerator

NGO: Non-Governmental Organization

PABC: Community-Based Adaptation Project

NAPA: National Adaptation Programmes of Action

PAN/LCD-GRN: National Programme of Action to combat Desertification and for Natural Resources Management

GDP: Gross Domestic Product

PNEDD: National Environmental Plan for a Sustainable Development

UNDP: United Nations Development Programme

PIP2: Private Irrigation Project

PPEAP: Agro-pastoral Products Promotion and Export Project

RGPH: Population and Housing General Census

SAP/GC: Early Alert System and Crises Management

SDR: Rural Development Strategy

SE/CNEDD: CNEDD Executive Secretariat

SNIS: National Health Information System

SNPA/CVC: National Strategy and Action Plan for Climate Changes and Variability

SNPA/DB: National Strategy and Action Plan for Biological Diversity

SP: Permanent Secretariat

PRS: Poverty Reduction Strategy

SVS: Vulnerability Oversight in the Sahel

UNITAR: United Nations Institute for Training and Research

ZARESE: Zones with high Environmental and Social Risks

Executive Summary

The climate in Niger is of the Sahelian type characterized by a great interannual rainfall, which has been expressed by multi-year droughts since 1968 (diagram2). This situation, linked to the climate nature and changes, through the adverse effects of extreme weather events, constitutes a great disadvantage for the development of the country. In fact, the ecosystems frailty makes the country very vulnerable to these events and the difficult socio-economic situation weakens its adaptability. In this regards , adaptation measures are necessary, in order to achieve a sustainable development.

In view of identifying and adopting these measures, Niger government created a technical Committee for Climate Changes and Variability (CNCVC) in July 1997. The said Committee elaborated its Initial National Communication (CNI) that was presented at the sixth Conference of the Parties in November 2000 at the Hague (Netherlands). Afterwards, it elaborated its National Strategy and Action Plan for Climate Changes and Variability (SNA/CVC) in April 2003. After this step, it undertook the NAPA elaboration process for climate changes with the financial support of the Global Environment fund (GEF) through the United Nations Development programme (UNDP).

The overall objective of the NAPA is to contribute to the alleviation of the adverse effects of climate variability and changes on the most vulnerable populations with the prospect of a sustainable development. In this area, some adaptation measures, consistent with the orientations of the Poverty Reduction Strategy (PRS) contained in the Rural Development Strategy (SDR), were identified. These adaptation measures are all in synergy with the measures of the Post-Rio convention adopted by Niger, especially the United Nations Framework on Climate Changes (UNFCCC), Convention to Combat Desertification (CCD), and the Convention on Biodiversity (CBD).

The NAPA process started in 2005. Its implementation was carried out within strict respect of the different steps indicated by the LEG guidelines and by focusing on three approaches:

- A consultative and participatory approach involving all the parties, particularly the regions, local authorities, local communities, representatives of the private sector, NGOs and Civil Social organizations.....;
- A multi-disciplinary and transparent approach based on the participation of all the specialists (as indicated in the list of the NAPA experts) on climate variability and changes;
- A complementary approach in which synergy with the existing National Plans and Programmes and Multilateral Environmental Agreements is taken into account.

This process got the following results:

- Identification of sectors, communities and areas that are most vulnerable to climate variability and changes;
- Identification of adaptation measures and sectors priority needs, communities and areas that are vulnerable to climate variability and changes;
- Identification of fourteen (14) adaptation options listed below:

1. Introducing fodder crop species in pastoral areas;
2. Creating Livestock Food Banks;
3. Restoring basins for crop irrigation;
4. Diversifying and Intensifying crop irrigation;
5. Promoting peri-urban market gardening and livestock farming;
6. Promoting income-generating activities and developing mutual benefit societies;
7. Water control;
8. Producing and disseminating meteorological data;
9. Creating Food Banks;
10. Contributing to fight against climate-related diseases;
Improving erosion control, water harvesting and conservation measures for agricultural,
11. forestry and pastoral purpose;
12. Dissemination of animal and crop species that are most adapted to climatic conditions;
13. Watershed protection and rehabilitation of dum_off ponds;
14. Building of material, technical and organizational capacities of rural producers.

All these activities were translated into project identification sheets.

These priority options involve different sectors of activities and focus on the local populations that are most vulnerable to the adverse effects of climate changes. Their implementation is of the greatest importance to achieve a sustainable development in Niger. They will be, by their very nature, under the responsibility of the decentralized sectorial departments of the involved Ministries . For the execution of these activities, the technical Departments will be supported by the running committees made up of all the project stakeholders. When necessary, they will also work with other organizations and/ or institutions present in the country.

At the national level, the CNEDD, within the framework of its missions, will coordinate the implementation of the identified projects.

1. Introduction and parameters

1.1. General characteristics of the country

Niger is a sahelian landlocked country whose nearest point to the sea is about 600 km. It covers a surface area of 1,267,000 sq km. It is located between the longitude 0°16' and 16° East and the latitude 11°1' and 23°17' North. The three fourths of the country's land area are occupied by deserts among which the Ténéré, one of the most wonderful deserts in the world.

The country's economy is mainly based on agriculture and cattle breeding. Furthermore, soils are generally poor and the area potentially suitable for crop production, estimated at 15 millions hectares, represent 12% of the country's total surface area. These lands, mainly covered by dunes, are not very productive and are sensitive to water and wind erosion.

The potential of irrigable land is estimated at 270,000 hectares of which 140,000 hectares in the river Niger valley.

Niger population was estimated at 11,060,291 people in 2001 (General census, 2001). Mainly rural, the populations draw most of their incomes from natural resources exploitation.

The growth rate of the population is one of the highest in the world. It was about 3.3 % in 2001. This population growth combined with difficult climatic conditions (droughts) and inadequate and not very rational use of natural resources led to ecological imbalances expressed by the deterioration of livelihoods.

According to the trends from national statistics, the population will reach 17.3 millions by 2015 and 24.1 millions by 2025

1. 1. 1. Biophysical characteristics

Characterized by low-lying (200 to 500 meters), the landscape is marked by very ancient mountainous massifs in the northwest (Aïr massif), plains and plateaus in the south. The northern part of Niger is occupied by great geomorphologic areas, the main of which are:

- The crystalline Aïr massif of which the highest point (Mount Greboune) is more than 2000 meters;
- The Termit sandstone massif;
- The great manuring areas from the Aïr;
- The desert plateaus;
- The large stretches of sand (Ténéré and Tal);

The southern part of Niger alternates plains and plateaus cut across by:

- Precambrian rock outcrop in the south;
- Hill range of the cretaceous and tertiary periods in the middle and eastern parts;
- Valleys and basins from the West to the East.

The climate is of the semi-arid tropical type, characterized by two seasons: a dry season from October to May and a rainy season from June to September.

During the dry season, the average temperature varies from 18.01° C to 31.1° C. During this season, the Harmattan (dry and hot wind) with moderate speed (5 to 10 m/s) blows from northeast or east and it is dominant throughout the country.

During the rainy season, the average temperature varies from 28.01° C to 31.7° C. The Monsoon (wet wind) blowing from Southwest to the Northeast is dominant in the main parts of the country. During this period, the speed of the wind is generally low or moderate (2 to 8

m/s). But instant high-speed winds (> 40 m/s) can be recorded.

The most extreme temperatures recorded are -2.4°C (in January 1995 in Bilma) for the minimum temperature, and 49.5°C (on September 7th, 1978 in Diffa) for the maximum temperature.

Rainfall is characterized by great variation in space and time. In normal years, this rainfall allows the increase of ground water, the formation of stretches of smooth water and the improvement of grassland. Since the early 1970's, rainfall has been decreasing; this is expressed by the movement of the isohyets to the south.

Thus, four climatic zones are observed in Niger (Diagram 1):

- The Sahel and Sudan zone that represents about 1% of the country's total surface area, and receives an annual rainfall ranging from 600mm to 800 mm. It is suitable for agriculture and livestock production;
- The Sahel and Sahara zone that represents 12% of the country's surface area and receives an annual rainfall average ranging from 150 to 300 mm. It is suitable for livestock breeding in transit;
- The Saharan desert zone, which covers 77% of the country's surface area and receives less than 150 mm of rainfall per year. People practice irrigated farming.

(Sources: CNEDD report on the environmental state in Niger and the National meteorological Department, 2005)

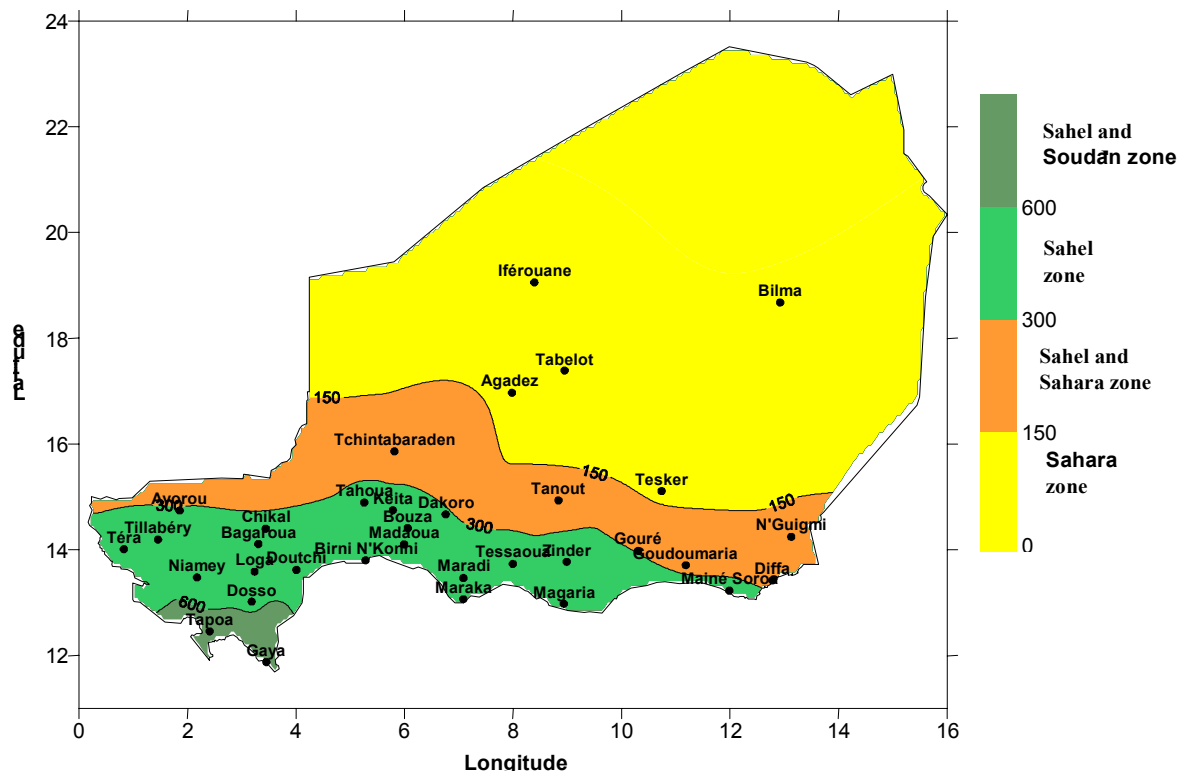


Diagram 1: Climatic zones in Niger (source: National Meteorological Department, average annual rainfall covering the period 1975 to 2004, 2005 edition).

As regards to pedology, the soils cultivated in Niger have a widespread organic matter and phosphorus deficiency. They are affected by a continuous fertility decrease, a trend to acidification, and sensitivity to water and wind erosion, a poor water retention capacity, and alkalization and salinisation events. It must be noticed that 80% to 85% of the lands suitable for cultivation are dunes and only 15% to 20% are hydromorphic and slightly clayey (SEDES, 1987). The mountainous areas and great plateaus (Aïr , Ader Doutchi, continental terminal) are dominated by lithosoils. The fossil valleys (Dallols, Goulbi, Korama), the river valleys, the Komadougou, the lake Chad and the Manga basins are mainly dominated by hydromorphic soils and vertisoils.

As regards to water resources, despite its dry weather, Niger has important ground and surface water resources which represent the main water supply of the country. However, the hydrographic network is relatively little compared to the situation in other West African countries. The major constraint is the accessibility to these resources because of the exploitation conditions often difficult. At this very moment, this difficulty does not allow the creation of necessary optimum conditions to the satisfaction of people's needs, livestock and other economic activities. The ground water renewal rate is estimated at 2.5 billion m³ per year. The non-renewable ground water resources are estimated at 2000 billion m³. The surface water resources are estimated at about 30 billion m³ per year.

In terms of vegetation, Niger hosts species and trees formations represented by many biographic strata. The Niger flora counts about 1600 species. The forested area is estimated at 14,000,000 ha. In the southern Sahel and Sudan strip, gallery forests and woody savanna areas are dominant. In the Sahel and Saharan zones, there are contracted trees formation such as shrubby and grasslands (SNPA/DB, 1998).

As far as wildlife is concerned, the bioclimatic terracing of Niger allows the country to have a rich and varied wildlife composed of 3,200 wild animal species of which 168 are mammals, 512 are birds, 150 are reptiles and amphibians, 112 are fish species and many invertebrates (molluscas, insects). (Data source: SNPA/DB, 1998).

The Niger mammal wildlife species is decreasing for two reasons:

- Human causes (poaching, competition with domestic animals and habitat destruction).
- Natural causes (droughts).

Furthermore, Niger has wildlife reserves and national parks.

The energy sector is dominated by the high consumption of the house energy sub-sector mainly based on wood resources (wood and biomass remnants). In fact these wood resources represent 90% of the energy appraisal against 8% for hydrocarbons and 2% for electricity. This situation contributes greatly to the deterioration of the forest.

The potentialities in renewable energies (solar, wind, water) are very important but they have not been much used up to now. As far as potentialities offered by uranium are concerned, they have not been used yet.

As regards to mines, the different mining and oil prospecting undertaken since 50 years in the Niger underground revealed the existence of a varied and considerable oil and mining potential: in total thirty mineral substances or more, and 300 indices and deposits have been recorded.

Apart from hydrocarbons and mineral substances that have been industrially or semi-industrially exploited (uranium, coal, limestone, phosphate, tin...), one can mention indices

and deposits of precious metals (gold, platinum, silver) special use metals (lithium, cobalt, chromium, manganese) and base metals (copper, lead, zinc).

The Niger industrial fabric is weak and mainly made up of some production units, especially cement, lime, agro-business (slaughter house, bakery, chemicals, breweries) and mining industries. In the early 1980's, the country experienced flourishing industrial units sequel to the uranium boom, particularly in the mid south of the country. At the present time, only some 33% of these units are operational with a reduced activity level. However, for some years now, a resumption of industrial activities can be noticed, due to the recently launched private sector promotion programme.

1.1. 2 Socio-economic characteristics

Niger counts 11,060,291 inhabitants (RGP/H, 2001). The average population growth rate is 3.3%. The average population density is 8.7 inhabitants per square kilometer. The majority of Niger people live in the south strip of the country suitable for agriculture and pastoral activities.

The economy of Niger is mainly based on the rural sector. In fact, in 2001, the agricultural and cattle breeding production contributed up to 38.1% of the country's GDP (Source: INS/ME/F, 2005). The relative share of each of these sectors is as following:

- Agriculture: 21.8%
- Cattle breeding : 10.1%
- Forestry and fisheries: 6.2%

The agricultural and cattle breeding products represent 27.2% of the total export revenues (Source INS/ME/F, 2005) mainly made up of:

- 18.2% of cattle breeding products (animals on the hoof);
- 9% of foodstuffs (food products and ginned cotton).

The rural sector constitutes the first job supplier. It represents 87% of the total population that have activities in the various sectors: agriculture, cattle breeding , forestry, wildlife and fisheries resources (SDR, 2003).

The fragile economy of the country is deeply affected by external and internal isolation, the high population growth, an ecological environment of the most difficult, and poverty. According to the report of the human development released in 2005 by UNDP, Niger is ranked 177th out of 177 countries with the human development index of 0.281. The human Poverty Index (IPH) is 64.4%.

In 2005, the country's standard of living is characterized by:

- Nominal per capita GDP: Fcfa 12,976;
- Life expectancy: 49.6 years;
- Child mortality: 108.2 children out of 1000;
- Illiteracy rate: 72.3%;
- Fertility rate: 7.2 children per woman.

(Source: INS/ME/F, 2005).

Urbanization has experienced a relatively rapid growth. The urban population, which represented only 5.3% in the 1960s, reached 13% in 2001. According to the forecast, it will reach 30% by 2020. This rapid growth of the urban population is related to rural drift.

According to studies carried out at the national level, particularly the PRSP, two Nigeriens out of three are poor and one out of ten lives in rural areas, and three out of four are women. In the urban areas, one Nigerien out of two is poor and one out of four is extremely poor.

1. 2. Pressures on the environment

Pressures made on the environment are mainly:

- Deforestation;
- Overgrazing;
- Poaching;
- Erosion;
- Proliferation of plastic and domestic wastes;
- Soil pollution;
- Pollution of surface and ground water;
- Bushfire.

1. 3. Disruptions caused by climate variability and changes

1. 3. 1. On the biophysical processes

Climate variability and changes cause many disruptions on the biophysical Processes, among which:

- Decrease in the forested areas due to greater needs for productive activities;
- Accelerated loss of biodiversity;
- Shortage of natural regeneration;
- Soils deterioration;
- Wind erosion;
- Decrease in rainfall and modification of its distribution in space and time;
- Reduction of surface waters and decrease of the ground water;
- Silting up which threatens the different watercourses, particularly the river Niger;
- Disruption and modification of the ecosystem;
- Proliferation of crop species not usable by livestock and population;
- Water stress due to heat;
- Effect on crops during flowering period;
- Increase in water requirement;
- Crop or harvest failure;
- Effects on wetlands;
- Loss of biological diversity;
- Loss of seedlings;
- Damages on habitats and other infrastructures;
- Proliferation of climate-related diseases;
- Water erosion of lands;
- Damages on forests, harvest and grazing.

1.3.2 On key sectors

The most vulnerable sectors retained as regards to NAPA are agriculture, cattle breeding, forestry, water resources, wildlife, health and wetlands.

The impact of climate variability and changes on these sectors can be summarized as follows:

Agriculture

The agricultural production that had been over target until the early 1970's covered only 86% of food needs by the end of the 1980's. Nowadays, it is in deficit mainly because of droughts. It was noticed that the crop production was particularly negative from 1989 to 1996 (Source: report on the assessment of climatic extreme events, 2005).

Floods as well as drought affect agriculture negatively. For the year 1998, for example, about 588 hectares of rice fields, 8608 hectares of millet fields and 203 orchards were damaged in Niger. Floods contribute to the destruction and loss of productions.

Cattle breeding

In Niger, the contribution of livestock was about 10 % of the GDP. The most common cattle breeding method is of the extensive and semi-extensive type.

The drought periods 1968-1973 and 1977-1985 caused great losses on the livestock. The latter was destroyed by more than 50%. As far as ovine breed is concerned, 5.04% of losses were recorded against 21.92% for goats in 1974. In 1984, the losses in the first year following the drought went up to 33% for goats and 35% for ovine breed. Thus, goats seem more resilient. Camels had the lowest loss rate: 17.48% in 1974 and 19% in 1984 (National report on vulnerability, 2003). So, it can be concluded that the drought periods endured in Niger are mainly the cause of a considerable reduction of the livestock, which represents the main production of the cattle breeders.

That year, according to the statement on damages issued by the SAP/ GC in its report N°37, 2005, floods killed 7798 animals (among which, 1554 big ruminants and 6544 small ruminants) throughout the country.

Forestry

About 338,180 hectares of the forest areas are lost because of droughts in 1968, 1973, 1977, 1985 and 2004 and some other human factors and climate variations. About 100,000 to 120,000 hectares of forest areas disappear every year (Source: CNEDD, Report on the State of Environment in Niger, 2005).

The surveys carried out on lost woody species or likely to be lost by the National Agronomic Research Project in the departments of Diffa, Zinder, Maradi, Dosso and Tahoua also reveal the effect of rainfall decrease on the extinction of many woody species (Larwanou, 1996, 1997, 1998).

Floods and torrential rainfalls and overflows cause losses in woody and herbaceous species. They contribute to the premature death of certain species and lead to the weak growth

of fodder crop species.

Violent sand storms often cause damages on forests, vegetation and soils.

Water resources

Water resources have suffered from the adverse effects of droughts during these last thirty years. In fact, the sensitivity of surface water resources to climate variability was brought into the fore through the use of the river Niger flow indices in Niamey, the flow of the Komadougou Yobé in Bagara, the flow of the Goulbi in Nielloua.

The strength of water run-off during torrential rainfalls deteriorates considerably the soils. Water takes away large quantities of sand; this results in the silting up of watercourses of which the most worrying is that of the river Niger.

Wildlife

Of the climate variation, the decrease of rainfall is one of the main habitat deteriorating factor and the reduction of biological diversity. Flooding and high temperature also cause the same effects on wildlife.

As far as bushfires are concerned, they destroy the wildlife and its habitat, and lead to wildlife species destruction. High temperatures cause the death of animals and slow down the reproduction of certain species through the drying out of water points.

Fisheries

Extreme weather events, particularly drought, have contributed to the drying out of water points, the reduction of fisheries production. It has then caused a decrease in the fishers' incomes.

Silting up of surface water points caused in long-term by torrential rainfalls and the increase of evaporation due to high temperatures, contribute to the reduction of fisheries production.

Wet lands

Like the devastating actions of man on natural resources (over use, silting up, cropping...), droughts constitute one of the dangerous enemies of wetlands. From 1974 to 2004, Niger suffered great losses of this ecological resource. In fact, if certain stretches of smooth water evaporated, others withdrew totally from Niger at a given time. This is the case of lake Chad, which withdrew under the effect of successive multi-year droughts. Floods/ torrential rainfalls cause the over flowing of wetlands with the destruction of infrastructures and lead to the drying out of wetlands.

Health

On the foodstuff plan, drought results in the starvation, which is certainly one of the causes of malnutrition and fragility of certain vulnerable groups, mainly pregnant or still feeding women and children. On the health plan, drought, in conjunction with high temperatures, intensifies certain diseases such as measles.

As regards to strong rainfalls and floods, they favor the proliferation of certain endemic diseases of which malaria is the most dangerous. Sand or dust storms combined to climate variability and changes such as the temperature and relative humidity of the air

intensify considerably certain lung diseases and cause eyes irritation. They can also be associated with the propagation of meningitis.

2. Framework of adaptation programme

2. 1. Climate variability and changes observed and forecast

2. 1. 1. Climate variability and changes observed

The analysis of rainfall reduced abnormalities (Diagram2) established on the basis of rainfall data from 59 meteorological stations from 1961 to 2001, shows a trend to decrease of rainfalls in the last thirty years. It must be reminded that abnormality is defined as the ratio of the difference between the parameter value of a given year and its average value, and the standard deviation in a given period.

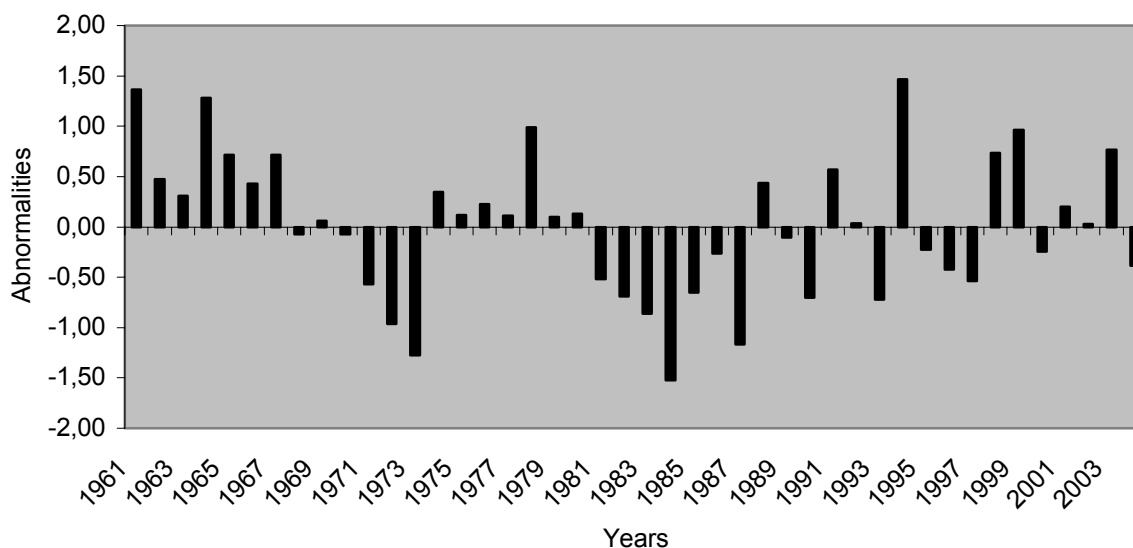


Diagram2: Annual average rainfall abnormalities from 1961-2004

Source: National Meteorological Department, 2006.

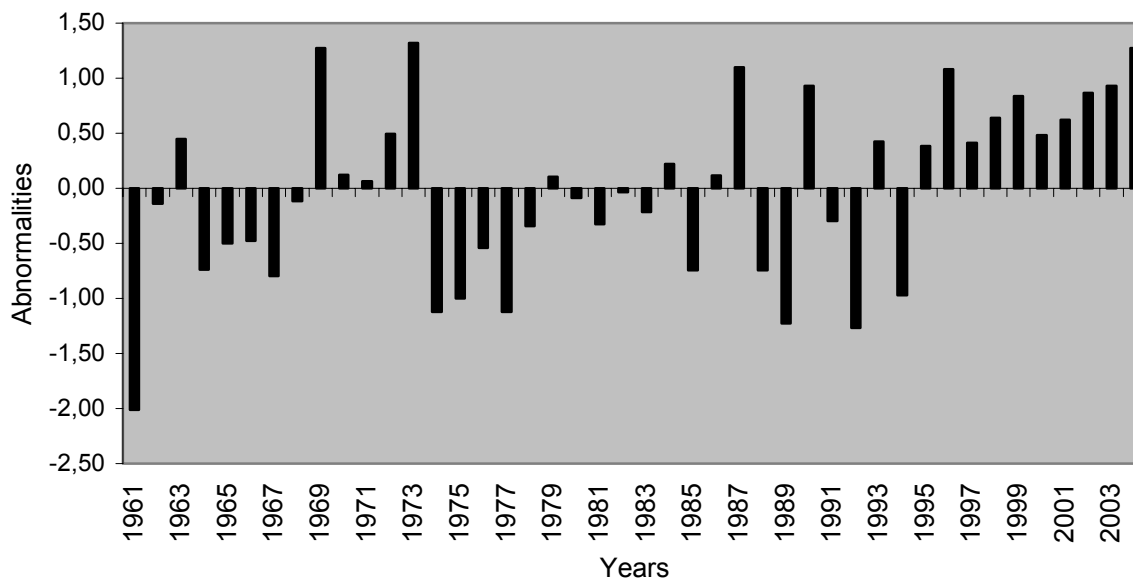


Figure 3: Annual average minimum temperature abnormalities from 1961-2004

Source: National Meteorological Department, 2006.

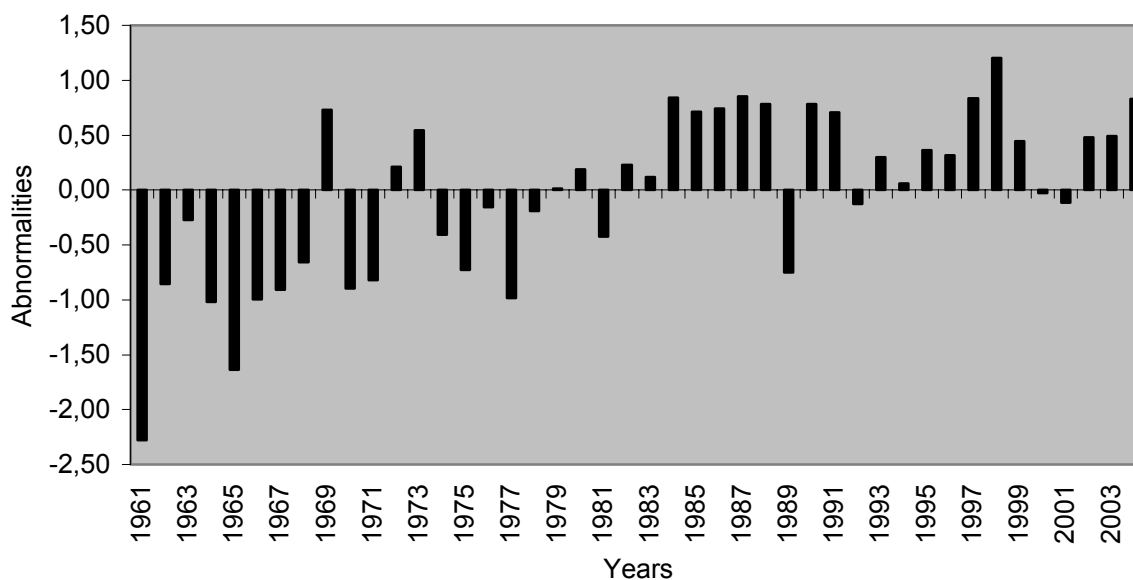


Figure 4: Annual average minimum temperature abnormalities from 1961 to 2004

Source: National Meteorological Department, 2006.

The data in diagrams 3 and 4 were collected from 13 meteorological stations during the period 1961 to 2001. The analysis of the maximum and minimum temperature abnormalities shows the following trends:

- A trend towards the decrease in maximum and minimum temperature from 1961 to 1986;

- A trend towards the increase in maximum and minimum temperature from 1986 to 2001.

2.1.2. Forecast climate variability and changes

The MAGIC/SCENGEN version 2.4 of May, 2000 model was used for the study of future climate changes. This model shows the possible climatic parameters to occur in a foreseeable future, i.e. 2025, through past climatic observations. The parameter analysis focuses on rainfall, temperature and nebulosity (cloud covering) data from meteorological stations throughout the country. The following results were observed:

- There will be an increase in the monthly average rainfall involving the period 1961 to 1990 (table 1 in appendix and diagram 5) by the year 2025 except for Tillabery and Niamey where a decrease will be observed. The most significant decrease will occur in Magaria at the far mid-south of the country. Even though these variations happen to be less important compared to the monthly average rainfall variability in Niger, they must be taken into consideration due to the short period of the rainy season, which never exceeds 4 or 5 months. The potential impacts of this increase will be more significant on sectors such as water resources, agriculture, and cattle breeding, due to their dependence upon this parameter. The impacts will depend on the intensity as well as the space and time distribution of the increase.
- As far as the monthly average temperature involving the period 1961 to 1990 is concerned (Table 2 in appendix and diagrams 6, 7 and 8), a slight increase will be observed by the year 2025 except for the meteorological stations of Bilma and Gaya. However, a quite significant increase of temperature will occur during the rainy season. For example 2.9° C in July and 3.1° C in August in Maradi; 2.8° C in July and 2.9° C in August in Magaria. The most significant average of monthly temperature, i.e., 3.1°C, will be recorded in Maradi.
- As far as nebulosity is concerned, there will be a slight decrease in the monthly average cloud covering compared with the period between 1961 and 1990 except for the meteorological station of Gaya. The highest decrease, i.e. 2.9 octas, will be observed in Bilma at the far north of the country.

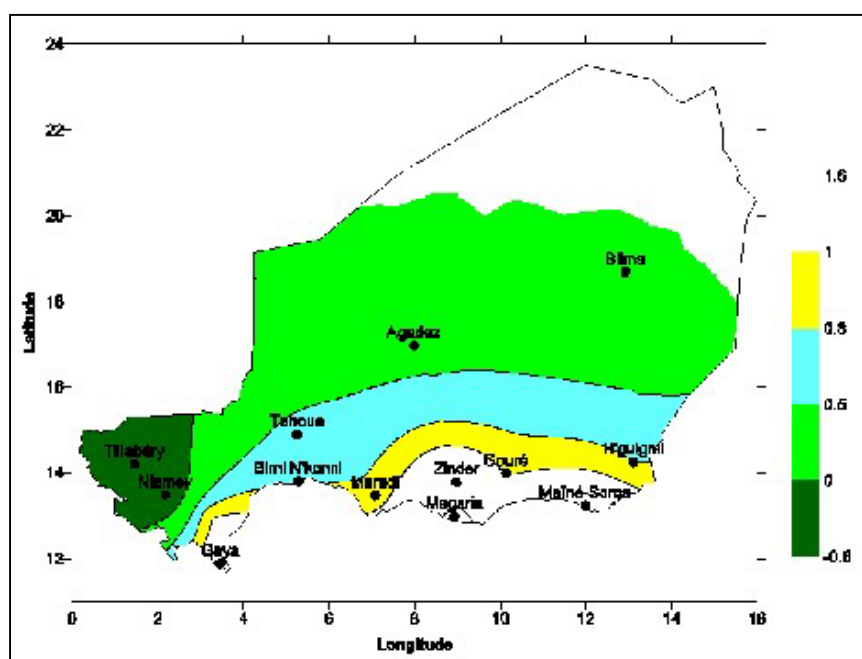


Diagram 5: Variation (in mm) by 2025 of the monthly average normal rainfall from 1961 to 1990

Source: Updated general report on vulnerability and adaptation to climate changes, 2003.

Diagram 6: Variation (in °C) by 2025 of the monthly average normal temperature from 1961 to 1990

Source: Updated general report on vulnerability and adaptation to climate changes, 2003.

Diagram 7: Variation (in °C) by 2025 of the monthly average normal maximum temperature from 1961 to 1990

Source: Updated general report on vulnerability and adaptation to climate changes, 2003.

Diagram 8: Variation (in °C) by 2025 of the monthly average normal minimal temperature from 1961 to 1990

Source: Updated general report on vulnerability and adaptation to climate changes, 2003.

Diagram 9: Variation (in Octas) by 2025 of the monthly average normal nebulosity from 1961 to 1990

Source: Updated general report on vulnerability and adaptation to climate changes, 2003.

2. 2. Adverse effects of Climate variability and changes

According to a NAPA study on identification and evaluation, the following are the main extreme weather events occurring in Niger:

- Floods;
- Droughts;
- Sandstorms;
- Extreme temperatures;
- Stormy winds.

Some other extreme weather events are also recorded:

- Locust invasion;
- Bushfire.

The main adverse effects of these events on the national economy in general and on the most vulnerable sectors are:

- Decrease in crop production;
- Fodder for livestock deficit;
- Shortage of water ponds;
- Water ponds silting up;
- Reduction of forested areas;
- Decrease in fisheries production;
- Decrease in biological diversity (species extinction and habitats deterioration);
- Increase in the rate of contracted diseases such as measles, meningitis, malaria and respiratory diseases;
- Formation of sand dunes

2. 3. NAPA Framework

The adverse effects of climate variability and changes represent a serious obstacle to the development of the country. Niger is very vulnerable to these phenomena due to the fragility of its ecosystem and to the difficult socio-economic context, which undermines the adaptation efforts in the country. So far, many adaptation measures have been taken in order to ensure a sustainable development in the country.

Some of these measures are:

- Creation of the National Technical Committee on Climate Changes and Variability in July 1997;
- Formulation of the Initial National Communication (CNI) presented in November, 2000, at the sixth Conference of the Parties in the Hague (Netherlands);
- Formulation of the National Strategy and Action Plan for Climate Changes and Variability (SNPA/CVC) in April 2003 and adopted in 2004.

Furthermore, Niger Government has triggered the process of NAPA formulation with the support of UNDP/ GEF.

The overall objective of NAPA is, thus, to contribute to the alleviation of the adverse effects of climate variability and changes on the most vulnerable populations in order to achieve sustainable development.

The specific objectives of the NAPA are:

- Identify the priority activities focusing on urgent and immediate needs for adaptation to adverse effects of climate variability and changes;

- Ensure a broad dissemination of activities towards stakeholders, actors and other beneficiaries;
- Build the adaptative capacities of the affected communities in the vulnerable areas;
- Develop synergies between the different strategic frameworks related to adaptation to climate changes and variability;
- Contribute to the preparation of the Niger's Second National Communication on climate changes.

2. 4. NAPA relationship with the National Development Objectives and the MEA

The relationships between the NAPA and the national development objectives are based on the links between NAPA adaptation measures and the national development priorities contained in the PRS and SDR papers.

Niger has formulated a Poverty Reduction strategy Paper (PRSP) in January 2002. This document represents the strategic reference framework of all the actions towards sustainable development in the country.

The NAPA adaptation measures match the orientations of the PRS and SDR with regards to food security, capacities building, water control, fight against desertification and the promotion of income-generating activities.

The overall objective of SDR and PRS is to reduce poverty level in the rural areas from 66% presently to 52% by 2015. Due to the importance of the task, the SDR stresses on three strategic axes in order to achieve this objective:

- Encouraging rural populations' access to economic opportunities in order to create the conditions for a sustainable economic growth in rural areas;
- Preventing risks, improving food security and managing efficiently the natural resources in order to secure the living conditions of the populations;
- Building the capacities of public institutions and rural organizations in order to improve the rural sector management.

It can therefore be concluded that the activities proposed by the communities for a specific sector match the policies of the sector as defined by the SDR. There is however, a pre-eminence of capacities building. The adaptation measures identified by the NAPA framework are also in synergy with the three post-Rio conventions: UNCCD, Convention on Biodiversity and UNFCCC.

2. 5. Obstacles to NAPA implementation

The main constraints to NAPA implementation are mostly related to the lack and/ or shortage of material and financial means due to the complexity of the extreme weather events and the importance of adaptation measures for the most vulnerable communities to climate variability and changes.

3. List of basic needs for adaptation to climate variability and changes

3. 1. Past and present practices

According to the synthesis report of the concerted assessment on vulnerability and adaptation carried out for NAPA, the most vulnerable areas are (see diagram 10):

- The rural district of Aderbissinat (Department of Tchirozerine/ Agadez Region);
- The rural district of Tondikiwindi (Department of Ouallam/ Tillabery Region)
- Village of Issari (Department of Diffa/ Diffa Region);
- Village of Tamalollo (Department of Tanout/ Zinder Region);
- Urban district of Loga (Department of Loga/ Dosso Region);
- Village of Soudouré (Urban district of Niamey 1/ Urban Community of Niamey/ Niamey Region).

According to the same report, the most vulnerable communities in the country are made up of cattle breeders, women, children, farmers, craftsmen, youth, the elderly and traders.

According to the study on adaptation measures and interviews with the main actors during field visits, the main adaptation practices still in use are:

- Rural drift;
- Sale of fuel wood;
- Sale of fodder;
- Sale of livestock;
- Gathering of non-woody forest products;
- Sale of crop residues;
- Sale of utensils and domestic appliances;
- Purchase of shortage-period foodstuffs (cassava flour);
- Mutual help;
- Sale of goods and equipments (cart, sword...);
- Well drilling for cattle breeders;
- Handicrafts;
- Casual manpower;

- Improving of income-generating activities;
- Rational use of food stock through rural drift;
- Sedentarization of cattle breeders;
- Off-season farming;
- Movement of the population in search of land and pasture;
- Barter practice (fuel wood for food);
- Birth control;
- Use of fast growing crop species.

However these practices appear to be ineffective for mid-term or long-term adaptation. Complementary adaptation measures were obtained through interviews with the different actors (identified vulnerable communities, technical services, project managers and NGOs from the visited areas):

- Development of the concerted management of water through management committees for national waters basin and through joint-commission and multilateral bodies for trans-border waters;
- Improvement of knowledge about the great fossil aquifers prior to a balanced exploitation;
- Adoption of adequate land policies that protect the rural producers;
- Mobilization of surface water for the improvement of crop production and supply of ground water;
- Prevention of risks and catastrophes resulting from floods;
- Strengthening of actions to stop desertification;
- Reinforcing water quality control;
- Improving structures to prevent and alleviate food shortage;
- Disseminating and promoting the use of meteorological counseling by farmers in their activities planning;
- Promoting irrigation;
- Choosing appropriate crop species for the different agricultural and ecological zones;
- Developing profitable channels;

- Reinforcing the monitoring system for agro-pastoral and hydrological activities;
- Breeding of livestock species most adapted to climate changes;
- Promoting methods for a rational management of food resources;
- Promoting intensive livestock farming;
- Improving knowledge on the available fodder crops;
- Research on climate-related diseases;
- Promoting non-conventional livestock farming;
- Implementing strategies on domestic energy, rural electrification and renewable energies;
- Participatory approach and rational management of forest resources;
- Developing agro-forestry;
- Restoring soil fertility;
- Promoting technologies to save energy;
- Creating carbon sequestration;
- Controlling water pollution;
- Developing fisheries activities;
- Formulating programmes for wildlife in situ conservation;
- Encouraging local population for wildlife resources management;
- Building capacities;
- Developing health infrastructures, especially in rural areas;
- Increasing the immunization against common diseases;
- Reinforcing sub-regional cooperation in order to prevent, detect and fight communicable diseases;

3. 2. Relevant solutions for adaptation

The implementation of the measures listed above will help to alleviate the adverse effects of variability and climate changes. The adaptations measures are gathered into twenty adaptation options listed below with respect to social and economic context of the country:

- Water control;
- Protecting riversides and restoring dump-off ponds;
- Creating food banks;
- Promoting income-generating activities and mutual benefit societies;

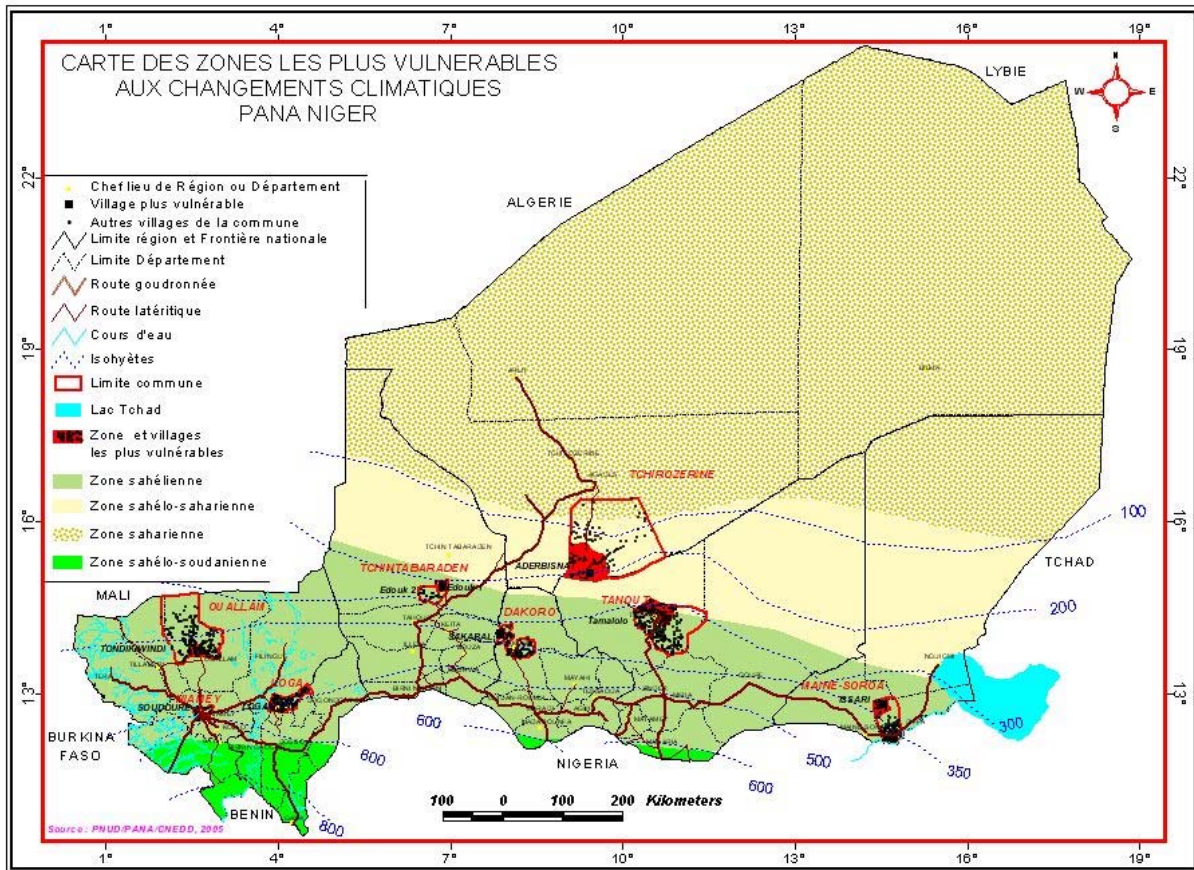


Diagram 10: The most vulnerable areas to variability and climate changes

4. Selection criteria for priority activities

In order to select priority activities within an exhaustive list of potential activities and at the same time maintain an easily manageable and comprehensive process, the LEG guidelines invite the parties to consider four main criteria for the NAPA elaboration:

- The level or the gravity of the adverse effects of climate changes directly linked to vulnerability indicators;
- Reduction of poverty in order to increase adaptative capacity;
- Synergy with other environment-related multilateral agreements;
- Cost-effectiveness ratio (financial consideration);

However, according to the LEG guidelines for NAPA formulation, countries are free to choose other criteria with regards to their specific situation.

4. 1. Criteria choice

In Niger, the criteria choice for NAPA formulation is based on the following guiding principles as defined by the LEG guidelines:

- A participatory process;
- A multi disciplinary approach;
- A complementary approach;
- A sustainable development;
- Gender equality;
- An approach focusing on the country's initiative;
- Rational management of the environment.

The NAPA team members have agreed on five criteria. These criteria take into account the NAPA characteristics, on one hand, and the specific conditions of the country with regards to vulnerability to the adverse effects of variability and climate changes, on the other hand. The five criteria agreed upon by the NAPA team members are:

1. Impact on groups and vulnerable resources;
2. Impact on economic growth rate of the poor;
3. Avoided losses for the poor;
4. Synergy with the multilateral and environmental agreements, projects and national programmes;
5. Cost.

4.2 Scoring criteria

1. Impact on groups and vulnerable resources will be measured through a scoring scale ranging from 1 to 5;
2. Impact on economic growth rate of the poor will be estimated in percentage through a scoring scale ranging from 1 to 5;
3. Avoided losses for the poor are quantified in FCFA per person and per year ranging from 50 to 450 millions;
4. Synergy with the multilateral and environmental agreements, projects and national programmes will be measured through a scoring scale ranging from 0 to 10;
5. The cost will be measured in FCFA ranging from 20 to 180 millions.

For the last four criteria, the lesser the scoring, the lesser the importance of the criterion for activity ranking. It is not the case with the cost.

4.3 Standardization

In order to compare simultaneously the options on the criteria basis, the NAPA experts have set up some standardization scales. This technique consists of expressing the criteria value in the same unit of measurement on a common scale. This is carried out through linear interpolation. Thus, for a given criterion, the current value is obtained through the formula:

$$\frac{V - V_i}{V_s - V_i}$$

Where v is the option value with regards to a specific criterion;

v_2 and v_1 respectively for superior and inferior bounds in the value scales of that criterion.

As a result of this interpolation, we obtain a value scale for each criterion ranging from 0 to 1

or from 0 to 100.... with increasing values for the benefits and decreasing values for the disadvantages.

In the case of Niger, the scale of values agreed upon ranges from 0 to 1 for all the criteria.

4. 4. Criteria weighting

All the criteria do not have the same importance for the actors that have participated to the ranking activities. Each criterion was given a relative weight. Following the discussions, it was agreed that more importance should be given on the criteria cost and impact of climate changes on groups and vulnerable resources.

The weighting factors given to each criterion are represented in table 4 in the appendix. Finally, for each option the scoring of each criterion is multiplied by the relative weight of the criteria in order to obtain a balanced scoring for each criterion.

5. List of priority activities

5. 1. Priority activities ranking

The method used for ranking activities is the multi-criteria analysis (MCA). All the calculations were carried out using Excel software.

Table 5 in the appendix shows the score given by the NAPA team to each activity with regards to each criterion.

Table 6 in the appendix shows the standardized score for each option with regards to each criterion, its standardized total score, its mean standardized score and its ranking.

After the ranking and due to the great number of options, the NAPA team agreed to suppress all options with mean score below 0.5. These are options N°5, 8, 11, 14, 17 and 19 as shown on table 6 in the appendix.

Thus we obtain, from the 14 remained options, the result shown on table 7 in the appendix. After standardization we obtain the results shown on table 8 in the appendix.

It can be observed, on table 8 a slight modification of the ranking compared to the previous steps: option N°1 moving from third to second and option N°16 moving from second to third.

During the first two steps, all the criteria have the same weight. But during the following step, the criteria were weighted as indicated above. Following the calculations after this weighting, we obtain the standardized score for each option with regards to each criterion, its standardized total score, its mean standardized score as well as its final ranking as shown on table 9 in the appendix. Slight modifications can also be observed with some option ranking.

Table 9 in the appendix refers to all the calculations done previously and shows the ranking of three options.

Table 10 in the appendix presents fourteen options, which were agreed upon resulting in the fourteen projects identification sheets.

5. 2. Projects profiles

A good monitoring of the priority options selected implies the preparation of projects papers prior to the formulation of the final NAPA. These projects papers are presented below in form of identification sheets:

IDENTIFICATION SHEET 1

Option: Introducing fodder crops species in pastoral areas

Project title: Fodder crops species introduction in pastoral areas

Geographical location

- Rural district of Aderbissanat (Department of Tchirozérine / Agadez Region)
 - Rural district of Chétimari (Department of Diffa / Diffa Region)
-

Sector : Cattle breeding

Justification

The Tadress and Issari areas represent important cattle rearing and transit zones for livestock drifting towards the North for the “Salt healing”. However, the present practices consisting of gathering fodder after the rainy season, over grazing during certain periods of the year, rainfall irregularity and erosion affecting pastoral areas represent limiting factors for fodder availability throughout the year. The introduction of high-nutritional-value fodder species can be a sustainable solution to deal with the situation.

This project is in conformity with one of the priority strategic axes of the SRP regarding the rural sector i.e the agro-sylvo-pastoral development

The final recipients of the project will be the pastors and the agropastors of the concerned zones.

Overall objective

Improve the fodder production in the project location in order to lessen the adverse effects resulting from climatic and human factors.

Specific objectives

- Build up fodder stock in order to prevent difficult periods;
 - Improve fodder quality and quantity;
 - Reduce livestock pressure on the natural resources.
-

Technical and financial feasibility

Technical feasibility :

- Availability of appropriate fodder crops species;
- Experience related to livestock farming;
- Existing training organizations (technical services and NGOs);
- Needs expressed by the populations during field visits;
- The project objectives match the PRS and SDR orientations.

Financial feasibility

- Support from GEF;
- Contribution from the government;
- Contribution from the local authorities;

- Contribution from beneficiary communities ;
- Presence of other projects in the project area (PAC, PACE, PADL, PPEAP, AZAWAK project, LUCOP, COGERAT, ..).

Expected results

- Fodder crops species production sites are delimited;
- Fodder crops species are introduced and improved;
- Fodder quantity and quality are improved;
- Populations' capacities are built.

Activities

- Sites identification;
- Identification of the most valuable fodder crop species;
- Public information and awareness on the importance of improved fodder production;
- Seeding and planting of fodder crop species;
- Mastery of cultural techniques ;
- Monitoring and evaluation.

Project related risks

- Delay in the cash outflow ;
- Climatic constraints(droughts);
- Locust invasion;
- Lack of fodder crops seeds .

Institutional set-up

The project will be under the responsibility of the Ministry of Animal Resources through its decentralized technical services in Tchirozerine and Diffa departments. A running committee made up of all the parties working with the project will support it. The project will also collaborate with research centers present in the country.

The project coordination and the implementation monitoring will be carried out by the National Environmental Council for a Sustainable Development (CNEDD).

Monitoring and evaluation

Monitoring and evaluation indicators

- Fodder crop species covering rate ;
- Number of introduced fodder crop species ;
- Techniques adoption rate;
- Estimated fodder production;
- Increasing the carrying capacity of treated plots.

Monitoring and control mechanism

- Field visits ;
- Mid-term and final assessment with comprehensive reports.

Project duration : Two years

IDENTIFICATION SHEET 2

Option : Creating Livestock Food Banks

Project title : Promotion of food banks for livestock

Geographic location

- Village of Issari (Rural district of Chétimari/ Department of Diffa/ Diffa Region)
- Villages of Edouk I and Edouk II (Rural district of Kaou/ Department of Tchintabaraden/ Tahoua Region)
- Rural district of Aderbissanat (Department of Tchirozérine/ Agadez Region)

Sector: Cattle breeding

Justification

In Niger, cattle breeding and agriculture represent the main activities. The large majority of the populations are either farmers or pastors 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 the livestock resulting in the shortage of animal products and ending up with the populations' impoverishment and malnutrition amongst the most vulnerable groups (women, children...).

This project which is in conformity with one of the priority strategic axes of the PRS regarding the rural sector i.e the agro-sylvo-pastoral development is aimed at alleviating the losses of livestock through an efficient supply of food supplements for livestock (cotton grains, wheat bran flour, groundnuts cakes...)

Overall objective

Contribute to the improvement of the living conditions of the local populations through the increase of animal productivity.

Specific objectives

- Ensure the permanent supply of livestock food supplements;
- Alleviate fodder shortage.

Technical and financial feasibility

Technical feasibility

- Availability of livestock food in the markets;
- Existing livestock farming-related experience;
- Existing training organizations (technical services and NGOs);

- Needs expressed by the populations during field visits;
- The objectives of the project match the PRS and SDR orientations.

Financial feasibility

- Support from GEF ;
- Contribution from the government;
- Contribution from local authorities;
- Contribution from beneficiary communities;
- Presence of other projects in the project location (PAC, PACE, PADL, PPEAP, AZAWAK project, LUCOP, COGERAT, ..).

Expected results

- Storages are built;
- Initial stocks are supplied;
- Livestock food is available;
- Management committees are set up and trained.

Activities

- Building storages;
- Purchasing and setting up of stocks;
- Training the management committees members;
- Monitoring and evaluation.

Project-related risks

- Delay in cash flow;
- Livestock food cost increase;
- Delay in the supply of the stocks.

Institutional set-up

The project beneficiaries are the rural populations. The Village Development Committee (CVD) is the contracting authority of the project. A running committee for the livestock food banks will be set up at the district level with the Animal Resources Service as the focal point. This committee is made up of:

- The prefect or his representative;
- The mayor of the district or his representative;
- The representative of the traditional authority;
- The representatives of the agriculture, community development, and the agricultural engineering services.
- A representative of NGOs working in the sector of livestock farming;
- The representative of the producers' organizations.

The Executive Secretariat of the CNEDD carries out the coordination and the monitoring of the project implementation.

Monitoring and evaluation*Monitoring and evaluation indicators*

- Number of renewed stocks;
- Number of storages available;
- Quantity of livestock food stored;
- Number of trained committee members.

Monitoring and evaluation mechanisms

- A daily monitoring will be carried out by the Village Development Committee through the bank management committee throughout the project duration;
- A quarterly (three months) monitoring will be carried out by the running committee in order to strengthen the local development organizations;
- The evaluation will be carried out by the CVD (self-evaluation) and organization framework CP, SE/CNEDD.

Project duration: two years.

IDENTIFICATION SHEET 3

Option : Restoring basins for crop irrigation

Project title: Restoration of basins for the promotion of crop irrigation

Geographic location

- Village of Issari (Chetimari rural district/ department of Diffa/ Diffa Region).
-

sector : Agriculture

Justification

Given the fact that Niger population is mainly rural (85% live in rural area and 80% practise agriculture) the rural sector must constitute the principal engine of the economic growth at short and medium term. the agricultural sector represents about 40% of gross domestic product (GDP) of Niger. Agriculture must thus be used as lever to the economic growth in rural area. However taking into account climatic uncertainties and of the brittleness of the Niger ecosystem, the effort of the agricultural development must especially be directed **towards** the control of water surface and a better mobilization of underground waters.

The basins in the region of Diffa represent an important zone of agriculture, cattle breeding and agro-forestry production. The deterioration of agro-ecological areas, resulting from climatic factors, is affecting the region of Diffa more than anywhere else in the country. The consequences of this situation are, among other: soils impoverishment, silting up of water courses leading to the reduction of water flow, and drying of water ponds; habitat destruction and disappearance of some flora species. This is the case of the basins located in the rural district of Chetimari, especially in the Issari village vicinity.

The local populations are the beneficiaries of the project. They draw their basic livelihood from agro pastoral activities and their living conditions have considerably deteriorated as a result of climatic events.

The implementation of this project will help to restore the basins and improve the socio-economic situation of the populations in Issari, in particular and in the rural district of Chétimari in general.

So, the control of water is one of the options of the Strategy of Poverty Reduction, unique national framework of reference as regards to economic and social development of the country through irrigated cultures.

Overall objective

Preserve the basins ecosystems in the Chétimari rural district and utilize water resources for the promotion of crop irrigation.

Specific objectives

- Restore the basins ;
- Exploit the restored basins for agricultural development.

Technical and financial feasibility*Technical feasibility :*

- Existing experience on CES/DRS and dunes restoration ;
- Existing experience in crop irrigation ;
- Existing training organizations technical services, NGOs;
- Needs expressed by the populations during field visits;
- The objectives of the project match the PRS and SDR orientations.

Financial feasibility

- Support from GEF ;
- Contribution from the government;
- Contribution from local authorities;
- Contribution from beneficiary communities;
- Presence of other projects in the project area (PAC, PAFEN, PADL, PIP2,PPEAP, Acacia project,..).

Expected results

- The basins are restored;
- Crop irrigation is realized in the basins;
- Crop production has increased.

Activities

- Fixation of sand dunes;
- Building of anti-erosion structures and trees planting;
- Soils enrichment;
- Agricultural exploitation of water resources;
- Capacities building;
- Setting up of management boards;
- Monitoring and evaluation.

Project related risks

- Rainfall: insufficient in quantity and ill-distributed;
- Outlet weakness ;
- Delay in cash flow.

Institutional set-up

The project will be under the responsibility of the departmental service of agricultural development in collaboration with the service of water resources and environment supported by the running committee including all the parties.

The coordination and monitoring will be carried out by the CNEDD.

Monitoring and evaluation

Monitoring and evaluation indicators

- The state of the basins and their surroundings ;
- The restored surface area;
- The area of fixed sand dunes ;
- The length (in meters) of erected fencing;
- The length (in meters) of realized structures;
- Number of trees planted.

Monitoring and evaluation mechanism

- Periodical field visits ;
- Periodical as well as final reports will be requested;
- Mid-term and final assessment of the project will be carried out.

Project duration : Three years.

IDENTIFICATION SHEET 4

Option : Diversifying and intensifying crop irrigation

Project title: Diversification and intensification of crop irrigation

Geographic location

- Villages of Edouk I and Edouk II (Rural district of Kaou/ Department of Tchintabaraden/ Tahoua Region)
 - Urban district of Niamey I (Urban Community of Niamey/ Niamey Region)
-

Sector : Agriculture

Justification

Following interviews with the populations in the urban district of Niamey I and in the villages of Edouk I and Edouk II, it was concluded that droughts and sandstorms have led to the drying up of water ponds; the setting up of water pools, the decrease of ground water and the diminution of irrigable land. This situation resulted in the decrease of crop yield and reduction of the biological diversity causing rural drift and deterioration of the populations' living conditions. The diversification and intensification of crop irrigation can represent an alternative for improving the populations' living conditions in these areas.

Indeed, it arises from the Poverty Reduction Strategy, unique national framework of reference as regards to economic and social development of the country, that the effort of the agricultural development must especially be directed towards the irrigated cultures through the control of water surface and a better mobilization of underground waters.

Overall objective

Encourage sustainable crop irrigation productivity in the project areas .

Specific objectives

- Contribute to the satisfaction of basic food needs of the populations;
 - Increase the producers incomes;
 - Facilitate producers' access to irrigation areas both in dry and rainy seasons.
-

Technical and financial feasibility

Technical feasibility:

- Existing experience on crop irrigation;
- Availability of seeds;
- Existence of training organizations (technical services and NGOs);
- Needs expressed by the populations during field visits;

- The objectives of the project match the PRS and SDR orientations.

Financial feasibility

- Support from GEF;
- Contribution from the government;
- Contribution from local authorities;
- Contribution from beneficiary communities;
- Presence of other projects in the project area (PAC, PAFN, PADL, PIP2, PPEAP, Azawak Project,..).

Expected results

- Irrigation infrastructures are rehabilitated and/ or created;
- The irrigation potential is increased and exploited;
- Land productivity is increased;
- The producers' revenues are improved;
- Exploitations and other production factors are rationally managed;
- The know-how of the farmers is increased;
- The capacities of technical services are reinforced;
- Rural drift is limited.

Activities

- Restoration and creation of irrigation infrastructures;
- Development and promotion of crop irrigation systems;
- Respect of crop schedule;
- Public awareness for the utilization of appropriate crop species;
- Making agricultural inputs accessible;
- Support for actions of Information, Education and Communication;
- Capacity Building of technical services;
- Improvement of the food and nutritional security of the populations;
- Wells drilling;
- Monitoring and evaluation.

Project-related risks

- Rainfall: insufficient in quantity and ill-distributed;
- Outlet weakness;
- Delay in cash flow.

Institutional set-up

The coordination and monitoring of the project implementation will be carried out by the National Environmental Council for a Sustainable Development and the implementation by the local agricultural development service with the collaboration of the local management committees.

Monitoring and evaluation

Monitoring and evaluation indicators

- Increase in output;
- Level of producers' incomes;
- Number of infrastructures restored and/ or created;
- Irrigated area;
- Number of introduced and utilized species;
- Increase in soil fertility;
- Exploitations productivity.

Monitoring ad evaluation mechanisms

- Field visits are organized periodically;
- Intermediate and final reports will be required ;
- Mid-term and final assessment of the project will be carried out.

Project duration : two years

IDENTIFICATION SHEET 5

Option : Promoting peri-urban market gardening and cattle breeding

Project title: Promotion of peri-urban market gardening and cattle breeding

Sector : Agriculture and cattle breeding

Geographic location : Urban district of Niamey I (Urban Community of Niamey/ Niamey Region)

Justification

Peri-urban market gardening and livestock breeding practiced by small holders play an important role in ensuring food security for the populations. But due to soil deterioration, decrease of the ground water level caused by climate variability and changes, and the use of rustic farming techniques, the agricultural output remain low. As far as livestock breeding is concerned, its potentialities made up of 35,000 individuals and some few millions of birds have so far not been fully exploited due to low food availability as a result of climatic and human factors. This lessens the development of the traditional livestock farming system.

Presently, these vulnerable smallholders benefit from little support from the local authorities and government. This project implementation is aimed at building their production capacities in order to satisfy the ever-growing demand in market gardening and livestock farming products and improving their incomes and living conditions.

This project which comes within the framework of the national policy as regards to the search of food security will enable the vulnerable populations to face the deficit of production relating to climate risks through the creation of the cereal banks.

Indeed, the agro-sylvo-pastoral development and food security constitute one of the strategic axes defined in the PRS regarding the rural sector. The priority actions envisaged for this purpose are inter alia: control and knowledge of the productive potential; control of water; improvement of the exchanges, transformation of the agricultural products, increase of locally manufactured agricultural equipment, increase in the capacities of decentralized financing of the rural producers, development of the information system on the markets; construction of regional infrastructures of storage and seeds conservation.

Overall objective

Contribute to the improvement of the populations' food security in the Urban Community of Niamey and the increase of their incomes.

Specific objectives

- Increase the agro-pastoral production;

- Enhance the supply and commercialization channels of inputs for gardening and livestock farming products;
- Capitalize the positive results for their use by other urban centers;
- Build the capacities of farmers and pastors.

Technical and financial feasibility

Technical feasibility :

- Existing experience on market gardening and livestock farming in the project location;
- Existence of training organizations (technical services and NGOs);
- Needs expressed by the populations during field visits;
- The objectives of the project match the PRS and SDR orientations.

Financial feasibility

- Support from GEF ;
- Contribution from the government;
- Contribution from local authorities;
- Contribution from beneficiary communities;
- Presence of other projects in the project area (PAC, PIP2, PACE..).

Expected results

- Peri-urban market gardening and cattle breeding are reinforced ;
- The capacity building of the technical trainers is reinforced ;
- The production systems and equipment are modernized ;
- The cooperative organizations are vitalized ;
- The producers' incomes are improved ;
- The food security is improved.

Activities

- Setting up of self-managing animal health services;
- Support for income-making activities through livestock farming for women;
- Enhancing fodder crops production;
- Decentralized supply and management of stocks;
- Constructions of inputs storages;
- Producers training on conservation and transformation techniques ;
- Creation and organization of outlet channels and installation of selling stores;
- Facilitating the products sales ;
- Monitoring and evaluation.

Project-related risks

- Urbanization ;
- Delay in cash flow ;
- diseases outbreaks (epizooties).

Institutional set-up

The coordination and evaluation of the project activities will be carried out by the National Environmental Council for a Sustainable Development (CNEDD) and the activities implementation by the departments of agricultural development and animal resources using a participatory approach for each category of actors.

Monitoring and evaluation

Monitoring and assessment indicators

- livestock population growth rate;
- Number of input storages built;
- Number of animal health services set up ;
- Level of producers' incomes ;
- Irrigated areas ;
- Output improvement.

Monitoring and control mechanism

- Close range monitoring to be carried out at the district and regional level;
 - Field visits are done;
 - mid-term and final assessment are carried out;
 - reports will be issued.
-

Project duration : Two years

IDENTIFICATION SHEET 6

Option : Promoting income-making activities and developing mutual benefit societies

Project title: Promotion of income-making activities and development of mutual benefit societies

Geographic location

- Urban district of Loga (Department of Loga/ Dosso Region)
 - Rural district of Aderbissinat (Department of Tchirozérine/ Agadez Region)
 - Rural district of Kaou (Department of Tchintabaraden/ Tahoua Region)
 - Rural district of Sakabal (Department of Dakoro/ Maradi Region)
 - Rural district of Tondikiwindi (Department of Ouallam/ Tillabéri Region)
 - Village of Issari (Department of Diffa/ Diffa Region)
 - Village of Tamallolo (Department of Tanout/ Zinder Region)
-

Sector : Agriculture, cattle breeding

Justification

Following the field visits it was concluded that the women and the youth represent the most vulnerable groups to adverse effects of climate changes. The multi-year droughts resulting from climate changes have contributed to the decrease of agro pastoral production in the areas listed above. 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 changes. In order to improve the populations' incomes and build their adaptative capacities to the adverse effects of climate changes, the promotion of income-making activities and the development of mutual benefit societies become necessary.

The implementation of a project relating to the Promotion of the Incomes Generating Activities and Development of the mutual benefit societies in the concerned areas will contribute not only to the improvement of the living conditions of the populations but also to reach the objectives of the PRS. Thus the development of incomes generating activities (AGR), through the improvement of exchanges, the transformation of the agricultural products, the increase of locally manufactured agricultural equipments , the increase in the capacities of decentralized financing of the rural producers, constitutes a priority for the Poverty Reduction Strategy.

Overall objective

Contribute to the fight against poverty through the diversification of income-making activities in the project areas.

Specific objectives

- Develop market gardening and intensive livestock farming ;
 - Encourage the creation of savings and credit institutions;
 - Reinforce economic activities for women and youth.
-

Technical and financial feasibility

Technical feasibility:

- Existing experiences on income-making activities in the project location;
- Existing training organizations (technical services and NGO);
- Needs expressed by the populations during field visits;
- Existing raw material;
- The project objectives match the SRP orientations.

Financial feasibility

- Support from GEF ;
 - Contribution from the government;
 - Contribution from local authorities;
 - Contribution from beneficiary communities;
 - Presence of other projects in the project area (PAFN, PADL, PAC, PIP2, PADAZ, AZAWAK project..).
-

Expected results

- The incomes of women and youth have increased ;
 - The outputs from market gardening have improved;
 - The animal and milk production improved;
 - The nutritional state of the populations improved.
-

Activities

- Supply of good quality seeds;
 - Purchase, rent and land exploitation by women;
 - Supply of fodder and monitoring animal health;
 - Counseling women on livestock farming and monitoring animal health;
 - Reinforcing and creating savings and credit institutions in the project areas;
 - Providing a good financing;
 - Setting up of management committees for credit allocation ;
 - Public information, awareness and training;
 - Monitoring and evaluation.
-

Project-related risks

- Delay in the cash flow ;
 - Seeds shortage;
 - Competitiveness of external products.
-

Institutional setup

Due to the multi-sector dimension of the project, its implementation will be carried out by many ministry departments, especially those in charge of agricultural, animal resources; communities development, handicrafts, economy and finance, women promotion, youth.

The project beneficiaries are women and youth.

A consultative committee made up of the representatives of the administrative authorities, district administration, traditional authorities as well as Civil Society will be set up.

This committee will be in charge of project activities and monitoring. As far as the project coordination is concerned it will be carried out by the Executive Secretariat of the CNEDD.

Monitoring and evaluation indicators

- Level of target groups' income and rural drift;
- Number of wells drilled for market gardening;
- Level of product consumption;
- Number of transformation units set up;
- amount of credit allocated and payment rate.

Monitoring and assessment evaluation

- Monthly and mid-term monitoring of the project ;
 - Final assessment to be carried out.
-

Project duration : Two years

IDENTIFICATION SHEET 7

Option : Water control

Project title : Mobilization of surface water and exploitation of ground water

Geographic location

- Villages of Edouk I and Edouk II, and Kaou rural district (Department of Tchintabaraden/ Tahoua Region)
- Tondikiwindi rural district (Department of Ouallam/ Tillabéri Region)

Sector: Water resources, Agriculture

Justification

Niger rural economy is not very competitive due to limited capacities of the intensive agricultural production systems and deterioration of the forest resulting from climatic factors and human actions. This situation is more perceptible in the villages of Edouk I and Edouk II, Tondikiwindi rural district.

The target beneficiaries will be the populations living in these areas vulnerable to climate variability and changes, particularly farmers and cattle breeders. The latter will improve their production techniques to make them more adequate. These populations have suffered difficult periods due to shortage of natural resources, which represent their livelihoods.

However, there are unexploited resources and available labor force. Subsequently, a new vision must be created through the initiation of a project for the mobilization of surface water and exploitation of ground water in the area.

This project is in line with the national orientations and strategies particularly the PRS which promote the control of surface water and a better mobilization of underground waters in order to direct the effort of the agricultural development towards the irrigated cultures taking into account climate uncertainties and the brittleness of Niger ecosystem.

The project is aimed at creating modern water points for people and their livestock. It also consists of support for the improvement of crop irrigation and promotion of livestock farming and forestry activities around the existing, created or restored water points. The volume of surface water resources to be mobilized will depend on local geological realities.

Overall objective

Contribute to the reduction of poverty and improvement of food security through the mobilization of water resources.

Specific objectives

- Increase the satisfaction rate of people and livestock's needs in the project areas;
- Improve agricultural productions (agriculture, livestock farming, fisheries);
- Contribute to the environment protection.

Technical and financial feasibility

Technical feasibility:

- Existing water potentials in the two localities;
- Mastery of water mobilization techniques by the technical services;
- Needs expressed by beneficiaries during field visits;
- Existence of a national strategy for the development of irrigation and the collection of run-off water (SNDI/CER);
- The project objectives match the PRS orientations.

Financial feasibility

- Support from GEF ;
- Contribution from the government;
- Contribution from local authorities;
- Contribution from beneficiary communities;
- Presence of other projects in the project area (PAC, Azawak Project, PPEAP, LUCOP, domestic and pastoral water resource resources, PMET...).

Expected results

- Modern water points for providing drinkable water are created or rehabilitated;
- Stretches of surface water are developed;
- Farming-oriented infrastructures for harnessing ground water (borings, wells, cesspools, etc) are created or rehabilitated;
- Irrigated crops and small livestock farming are promoted around the water points;
- Fisheries activities are carried out;
- Enrichment planting carried out on the sites.

Activities:

- Creation and/ or restoration of modern water points for providing drinkable water;
- Development of surface water points;
- Building or rehabilitation of ground water harnessing infrastructures intended for the small irrigation;
- Improvement of crop irrigation around these water points;
- Carrying out fisheries activities;
- Reforestation;
- Monitoring and evaluation.

Project-related risks:

- Delay in cash flow
- Rainfall deficit.

Institutional set-up

The project will be implemented under the responsibility of the agricultural development departments in collaboration with the water resources services. The project will be supported by a running committee made up of all the parties working with the project. The coordination and the implementation monitoring will be carried out by the National Environmental Council for a Sustainable Development (CNEDD).

Monitoring and evaluation:*Monitoring and evaluation indicators*

- Rate of water needs satisfaction;
- Agricultural, forestry and pastoral production growth rate;
- Rate of youth unemployment reduction.

Monitoring and evaluation mechanisms

The project will have mid-term and final reviews and field visits as well. Moreover, intermediate and final reports will be issued.

Project duration: Three years.

IDENTIFICATION SHEET 8

Option : Producing and disseminating meteorological data

Project title : Production and dissemination of agro-meteorological data.

Geographic location:

- Chétimari rural district (Department of Diffa/ Diffa Region)
 - Loga rural district (Department of Loga/ Dosso Region)
 - Sakabal rural district (Department of Dakoro/ Maradi Region)
 - Kaou rural district (Department of Tchintabaraden/ Tahoua Region)
 - Tondikiwindi rural district (Department of Ouallam/ Tillabéri Region)
 - Village of Tamallolo (Department of Tanout/ Zinder Region).
-

Sector : Agriculture and Cattle breeding

Justification

Multi-year droughts, locust invasion, floods and land deterioration are mainly responsible for the decrease in agro pastoral production, thus exposing the vulnerable populations to food insecurity. Information dissemination (agro-meteorological counseling) as well as efficient preventive and alleviating measures can contribute to lessen the adverse effects of climate changes on the production. On the other hand, this information is not well known to the producers and they are often inadequately utilized. Thus, information dissemination in rural areas becomes necessary.

the project is in line with the Poverty Reduction Strategy, unique national framework of reference as regards to economic and social development of the country, as it comes out from the PRS that the Niger populations being mainly rural, amply justifies that the rural sector must constitute the principal engine of economic growth at short and medium term. the agricultural sector represents alone nearly 40% of gross domestic product (GDP) of Niger. Thus, Agriculture must be used as lever of the economic growth in rural area. The production and diffusion of agroclimatic information to the rural populations will highly contribute to their adaptation to rain irregularities .

Overall objective:

Contribute to the achievement of food security for the population in the project areas.

Specific objectives:

- Increase crop production;
- Increase livestock productivity;
- Increase the incomes of the most vulnerable populations in the project area;

- Build the populations' capacities towards a better understanding of climatic events and early alert system.

Technical and financial feasibility

Technical feasibility :

- Existing structures for observations, concentration, analysis and dissemination of data;
- Existing tools for data processing;
- Existing of training organizations (technical services);
- Needs expressed by the populations during field visits;
- The project objectives match the PRS orientations.

Financial feasibility

- Support from GEF ;
- Contribution from the government;
- Contribution from local authorities;
- Contribution from beneficiary communities;
- Presence of other projects in the project area (PAC, CILSS-SVS project)

Expected results:

- The use of agro-meteorological counseling by the farmers whose operational planning is promoted;
- Early alert to climate risk is operational.

Activities:

- Creation of community radios in Kaou, Sakabal, Tondikiwindi and Tamallolo ;
- Identification, with producers, of relevant data to be disseminated ;
- Consultation with stakeholders (local technical services) in charge of data collection and those in charge of information dissemination (community radios, farmers organizations, NGOs);
- Training of producers;
- Training of stakeholders in data collection and dissemination;
- Building of meteorological observation network and supply of technical services with equipment for data collection and processing;
- Collection and transmission of base data;
- Production of agro meteorological bulletins;
- Monitoring and evaluation.

Project-related risks:

- Delay in cash flow;
- Delay in data flow.

Institutional set-up:

The project is under the responsibility of the Ministry in charge of meteorology in collaboration with the decentralized departments of food crop, animal resources, local NGOs and community radios. The coordination and monitoring of project activities will be carried out by the national Environmental Council for a Sustainable Development (CNEDD).

Monitoring and evaluation*Monitoring and evaluation indicators:*

- Number of radio stations created;
- Number of trained people;
- Number of agro-climatic bulletins broadcast;
- Number of producers using these data.

Monitoring and evaluation mechanisms

- Annual surveys;
 - Field visits;
 - Report issued.
-

Project duration : Three years.

IDENTIFICATION SHEET 9

Option : Creating food banks

Project title: Promotion of food banks

Geographic location

- Village of Issari (Chétimari rural district/ Department of Diffa/ Diffa Region)
 - Tondikiwindi rural district (Department of Ouallam/ Tillabéri Region)
 - Aderbissanat rural district (Department of Tchirozérine/ Agadez Region)
 - Loga rural district (Department of Loga/ Dosso Region)
 - Sakabal rural district (Department of Dakoro/ Maradi Region)
 - Tanout urban district (Department of Tanout/ Zinder Region)
-

Sector: Agriculture

Justification

For decades, Niger has, especially in the above-mentioned areas, recorded multi-year crop deficit leading to food insecurity for rural populations who depend on agriculture for more than 80%. This situation is mainly related to climate hazards and deterioration of natural resources under human and natural pressure. This insecurity concerns mainly the most vulnerable groups made of women and children. To cope with the situation, the populations eat shortage-periods food (fruits and leaves), sale of domestic appliances, felling and sale of fuel wood as livelihoods. This project which comes within the framework of the national policy as regards to food security will allow vulnerable populations to tackle the production deficit related to climate risks through the creation of food banks.

, agro-sylvo-pastoral development and food security constitute one of the strategic axes defined in the PRS with regard to the rural sector. The priority actions envisaged for this purpose are inter alia: control and knowledge of the productive potential; improvement of food crises prevention and mitigation mechanisms; development of information systems on the markets; reinforcement of the instruments of food crises management; establishment of cereal banks; construction of regional infrastructures for seeds storage and conservation.

Overall objective:

Contribute to the improvement of the populations' living conditions against food insecurity related to adverse effects of climate changes in the project location.

Specific objectives:

- Supply foodstuffs permanently;
- Make security stocks;

- Reduce food crop deficit.

Technical and financial feasibility:

Technical feasibility:

- Existing foodstuffs in the market;
- Existing training by the technical services and NGOs;
- Needs expressed by the populations during field visits;
- The objectives of the project match the PRS orientations.

Financial feasibility

- Support from GEF;
- Contribution from the government;
- Contribution from local authorities;
- Contribution from beneficiary communities;
- Presence of other projects in the project area (PAC, PADL, Azawak project, PPEAP, LUCOP, COGERAT)

Expected results:

- Storages are available;
- Initial stocks are made up;
- Foodstuffs are available;
- Management committees are set up and trained.

Activities:

- Public information and awareness;
- Building of storages;
- Purchase and storing of stocks;
- Stock management;
- Installation of management committees;
- Training of management committee members;
- Monitoring and evaluation.

Project-related risks:

- Delay in cash flow;
- Stock renewal.

Institutional setup

The beneficiaries being the rural populations, the Village Development Committee (VDC) will be the contracting manager. A running committee of all the food banks will be set up at the level of each district with the rural development service as focal point. This committee is made up of:

- The prefect;
- The district mayor or his representative;
- A representative of traditional authorities;

- A representative of the agricultural service;
- A representative of Community Development;
- A representative of the NGOs working in the field;
- A representative of the producers' organization.

The Executive Secretariat of the CNEDD carries out the coordination and monitoring of the project implementation.

Monitoring and evaluation:

Monitoring and evaluation indicators:

- Number of stocks turnover;
- Number of storages available;
- Quantity of food stocked;
- Number of management committees trained.

Monitoring and evaluation mechanisms:

- A daily monitoring will be carried out by the Village Development Committee through the management committee of the food bank during the project duration;
 - A quarterly monitoring will be carried out by the running committee so as to make the basic development structures more efficient;
 - The management will be carried out by the CVD (self-evaluation), in one hand, and by all the structures of the running committee, SE/ CNEDD in the other hand.
-

Project duration: Two years

IDENTIFICATION SHEET 10

Option: Contributing to fight against climate sensitive diseases

Project title: Contribution to the fight against climate sensitive diseases.

Geographic location:

- Aderbissanat rural district (Department of Tchirozérine/ Agadez Region)
 - Loga urban district (Department of Loga/ Dosso Region)
 - Kaou rural district (Department of Tchintabaraden/ Tahoua Region)
 - Village of Issari (Chétimari rural district/ Department of Diffa/ Diffa Region)
 - Tondikiwindi rural district (Department of Ouallam/ Tillabéri Region)
 - Sakabal rural district (Department of Dakoro/ Maradi Region)
 - Village of Tamallolo (Department of Tanout/ Zinder Region)
 - Urban district of Niamey I (Urban Community of Niamey/ Niamey Region)
-

Sector: Health

Justification

The studies of vulnerability and adaptation carried out during field visits have shown a close relationship between some climate parameters and the incidence rate of some diseases such as malaria, meningitis, measles and seasonal respiratory diseases. Beside these diseases, the extreme variations of climate parameters such as temperature, sandstorms represent a worsening factor for the propagation of other diseases (eyes irritation). Due to the weak adaptative capacity of the populations and actors involved in the health sector, building their capacities to fight efficiently these climate sensitive diseases is urgent.

Thus, the PRS, in the area of health, envisages the following actions among many others: increase the availability of human, material and financial resources; promotion and development of IEC activities for health and reinforcement of the monitoring of e diseases with epidemic potential. Thus this project is in conformity with the objectives of the PRS .

Overall objective

Improve the health conditions of the local vulnerable populations that are exposed to adverse effects of climate changes.

Specific objectives

- Diminution of the incidence of major climate sensitive diseases on the vulnerable populations;
- Building the adaptative capacities of the populations to climate conditions causing these diseases.

Technical and financial feasibility

Technical feasibility:

- Existing integrated health centers in the project areas;
- Existing training organizations (technical services and NGO);
- Needs expressed by the populations during field visits;
- The project objectives match the PRS orientations;
- The project objectives match those in the Programme for Health Development.

Financial feasibility

- Support from GEF;
 - Contribution from the government;
 - Contribution from local authorities;
 - Contribution from beneficiary communities;
- Presence of other projects in the project area (PAC, PADL, AZAWAK project, Water resources project DANIDA, LUCOP, PAGRN, COGERAT).

Expected results

- Satisfaction of health needs in the vulnerable areas;
- Building the adaptative capacities of the vulnerable populations;
- Reduction of the incidence rate of malaria, meningitis and measles.

Activities

- Public information and awareness on the practices to avoid climate sensitive diseases;
- Reinforcement of the alert system and management of endemic climate hazards;
- Training of health staff in quantity and quality;
- Distribution of treated mosquito nets;
- Treating mosquitoes hidings with pesticides;
- Equipment of health centers with material, drugs and well-trained staff;
- Monitoring and evaluation.

Project related risks

- Delay in cash flow;
- Lack of products for treatment.

Institutional set-up

The project will be under the responsibility of the Ministry of health. It will cover the following zones : Issari, Tamallolo, Loga, Sakabal, Kaou, Tondikiwindi, Aderbissinat and the urban community of Niamey. It will involve the National Department of Meteorology, ACMAD, CERMES, SNIS, community radios, NGOs and other actors intervening in the sector. As far as the coordination and monitoring of project activities are concerned, they will

be carried out by the executive secretariat of the CNEDD.

Monitoring and evaluation

Monitoring and evaluation indicators

- The incidence rate of climate sensitive diseases;
- The mortality rate linked to these diseases;
- Existing functioning health centers;
- Number of mosquito nets distributed;
- Number of equipped health centers;
- Number of warnings broadcast with regards to diseases outbreak.

Monitoring and evaluation

- Annual survey;
 - Field visits;
 - Reports issued.
-

Project duration: Two years

IDENTIFICATION SHEET 11

Option: Improving anti-erosion actions (CES/DRS) for agricultural, forestry and pastoral purposes

Project title: Development of anti-erosion infrastructures (CES/DRS) for agricultural forestry and pastoral purposes

Geographic location

- Urban district of Loga (Department of Loga/ Dosso Region)
 - Rural district of Tondikiwindi (Department of Ouallam/ Tillabéri Region)
-

Sector: Agriculture, Forestry, livestock farming

Justification

The urban district of Loga and the rural district of Tondikiwindi have experienced a speeded-up deterioration of natural resources in recent years. This situation results from the adverse effects of climate changes (droughts, sandstorms, floods...). The installation of the project will reduce the vulnerability of the populations faced with climate changes adverse effects in one hand, and fight poverty in the other hand. The populations in these areas will be the target beneficiaries of the project. The implementation of this project which is in the line with the orientations in the PRS will help to reduce deteriorated land and improve the socio-economic situation of the vulnerable populations.

, thus the actions of CES/DRS are in the center of the national policy of environment restoration and protection. The environment restoration and protection will be achieved through inter alia: the rehabilitation of degraded lands by the generalization of CES/DRS activities which will be carried out by the populations and the formulation of action plan for the creation and management of agricultural, forest and pastoraes stocks

The beneficiaries of this project will be the local populations.

Overall objective

Contribute to the restoration of deteriorated zones and fight food insecurity facing the vulnerable populations.

Specific objectives

- Restore deteriorated lands;
- Preserve natural resources;
- Improve soil productivity;
- Improve the income of the target populations.

Technical and financial feasibility

Technical feasibility:

- Mastery of anti-erosion techniques by the technical services and the population in the project zone
- Existing training organizations (technical services);
- Needs expressed by the populations during field visits;
- The project objectives match the PRS orientations;
- The project objectives match those of PAN-LCD/GRN.

Financial feasibility

- Support from GEF;
 - Contribution from the government;
 - Contribution from local authorities;
 - Contribution from beneficiary communities;
- Presence of other projects in the project area (PAC, PPEAP, PIP2, LUCOP, Italy and CILSS Fund, FLCDRPS, Care international).

Expected results

- The deteriorated lands are restored;
- Small nurseries are created;
- Natural resources (water, vegetation) are preserved;
- The populations' incomes are improved.

Activities

- Creation of small anti-erosion infrastructures;
- Setting up of anti-erosion systems;
- Reforestation, land grassing, creation of small nurseries;
- Sand dunes erection;
- Monitoring and evaluation.

Project-related risks

- Delay in cash flow;
- Labor shortage.

Institutional set up

The project will be implemented under the responsibility of the decentralized service of the Ministry of Agricultural Development in collaboration with the Ministry of Water Resources and Environment. The project will then be managed by a Village Development Committee, which will set up a specific sub-committee in charge of operations. The coordination and monitoring of the implementation will be carried out by the CNEDD.

Monitoring and evaluation

Monitoring and evaluation indicators

- Level of production reached;
- Number of small infrastructures built;
- Area of restored land.

Monitoring and evaluation mechanism

- Annual surveys;
- Field visits;
- Issuing of reports;
- Installation of monitoring and evaluation structures:
 - At the local level: Village Development Committee
 - At the district level: District Development Committee
 - At the department level: service providers (NGOs, organizations, technical services)

Project duration: Two years

IDENTIFICATION SHEET 12

Option: Popularizing animal and crop species that are most adapted to climatic conditions

Project title: Popularization of animal and vegetative species that are most adapted to climatic conditions

Geographic location

- Rural district of Aderbissinat (Department of Tchirozérine/ Agadez Region)
 - Villages of Edouk I et Edouk II (district of Kaou/ Department of Tchintabaraden/ Tahoua Region)
-

Sector: Agriculture, cattle breeding , Forestry

Justification

Agro-sylvo-pastoral development and food security are one of the strategic axes identified in the PRS regarding the rural sector. The priority actions envisaged for this purpose are inter alia: control and knowledge of the productive potential; conservation and valorization of the genetic resources; creation and rehabilitation of the avicolous centers; reinforcement of research capacities and technology transfer, construction of regional infrastructures for seed storage and conservation .

However agriculture, cattle breeding and forestry are sectors depending directly on climate. In fact, for the past thirty years , the climatic conditions in Niger have been deteriorating. This results in loss of soils, genetic material and species. This situation is expressed by the decrease in productions and productivity in the three above-mentioned sectors. To deal with this situation, the local communities, deeply affected by the adverse effects of climate changes, must adopt crop species more resilient to present climatic conditions.

The direct beneficiaries of the project will be the pastors, agro-pastors and farmers of the concerned zones.

Overall objective

Contribute to the increase of agricultural, forestry and pastoral production in the project area .

Specific objectives

- Popularize animal and crop species most resilient to climatic conditions;
 - Facilitate the acquisition of these species by the populations.
-

Technical and financial feasibility

Technical feasibility:

- Availability of species resilient to climate;
- Existence of training by the technical services;
- Needs expressed by the populations during field visits;
- The objectives of the project match the PRS and SDR orientations.

Financial feasibility

- Support from GEF;
 - Contribution from the government;
 - Contribution from the local authorities;
 - Contribution from beneficiary communities;
- Presence of other projects in the project area (PAC, PPEAP, LUCOP, AZAWAK project, Care International...).

Expected results

- The incomes of women and youth have increased;
- Crop productions are improved;
- Animal productions are increased;
- Forestry and pastoral productions are improved.

Activities

- Making the population aware of the advantages related to the species;
- Putting the species to be popularized at the disposal of the population;
- Create nurseries;
- Popularizing of animal and crop species;
- Monitoring and evaluation.

Project related risks

- Delay in cash flow;
- Persistence of droughts;
- Communicable diseases.

Institutional set-up

The project will be under the responsibility of the Ministry of Agriculture in collaboration with the Ministries of Animal Resources and Environment through their decentralized technical services. The project will be supported by the running committee made up of all the parties working with the project. It will also collaborate with research centers present in the country. As far the coordination of activities and monitoring of implementation are concerned, they will be carried out by the Executive Secretariat of the CNEDD.

Monitoring and evaluation

Monitoring and evaluation indicators

- Rate of adoption of different species;
- Number of popularized species;
- Number of producers having adopted the chosen species.

Monitoring and evaluation mechanism

- Monthly monitoring;
- Mid-term review;
- The evaluation at the end of the project will be carried out.

Project duration: Two years

IDENTIFICATION SHEET 13

Option: Protecting riversides and restoring silted up ponds

Project title: Protection of riversides and restoration of silted up ponds

Geographic location:

- Aderbissanat rural district (Department of Tchirozérine/ Agadez Region)
 - Urban district of Niamey I (Urban community of Niamey/ Niamey Region)
-

Sector: Water resources

Justification

For many years, the rural district of Aderbissanat and the urban district of Niamey I have been affected by the adverse effects of climate changes and the high deterioration of ecosystems. This situation requires Niger to protect watercourses and restore silted up ponds identified by the communities in the vulnerable areas. Once restored and rehabilitated, these ecosystems would allow a better supply of water for the vulnerable populations and promote the development of farming and pastoral activities. The rehabilitation actions will help reduce solid wastes and increase the volume of water in the ponds and reach a better regulation of their hydrology. The populations in these localities will be the target beneficiaries of the project. The implementation of the present project will enable to improve the social and economic situation of the vulnerable populations.

The action envisaged at this level is in the line with the national policy on water and cleansing and particularly with one of its four (4) priority axes namely , the improvement of the knowledge on water resources, their management, and protection as well as environment conservation .

Overall objective:

Contribute to the protection and restoration of ecosystems to supply the vulnerable populations with sufficient water resources.

Specific objectives:

- Contribute to the satisfaction of water needs for livestock and crops;
 - Fight against silting up of water ponds;
 - Stock water in the ponds for pastoral activities.
-

Technical and financial feasibility

Technical feasibility:

- Mastery of riversides protection techniques and rehabilitation of ponds by the technical

- services and the populations in the two localities;
- Existence of training by the technical services;
- Needs expressed by the populations during field visits;
- The project objectives match those of the PAN-LCD/ GRN;
- The project objectives match the SDR orientations.

Financial feasibility

- Support from GEF;
- Contribution from the government;
- Contribution from local authorities;
- Contribution from beneficiary communities;
- Presence of other projects and NGOs (PAC, PPEAP, PIP2, LUCOP, COGERAT, AZAWAK project, Care International...).

Expected results:

- Water needs for livestock and crops satisfied;
- Deteriorated water courses are treated;
- Fisheries activities resumed in the restored ponds.

Activities:

- Building of sand seats to treat water courses embankments;
- Plantation of live fences and erection of other fences;
- Ponds dredging;
- Monitoring and evaluation.

Project-related risks:

- Delay in cash flow.

Institutional set-up:

The project will be implemented under the responsibility of the technical service of the Ministry of Agricultural Development. The project will be managed by a Village Development Committee, which will set up a specific sub-committee in charge of operations. The coordination and the implementation monitoring will be carried out by the National Environmental Council for a Sustainable Development.

Monitoring and evaluation

Monitoring and evaluation indicators

- Number of ponds rehabilitated;
- Quantity of water supply increased;
- Level of reduction of solid wastes.

Monitoring and evaluation mechanisms

- Yearly surveys;
- Field visits;
- Report issuing;
- Establishment of a monitoring and evaluation plan:
 - At local level: Village Development Committee;
 - At district level: District Development Committee;

- At department level: service providers (NGOs, Organizations, technical services) will support the beneficiary populations in the infrastructures implementation techniques.

Duration: Two years

IDENTIFICATION SHEET 14

Option: Building material, technical and organizational capacities of rural producers.

Project title: Building material, technical and organizational capacities of rural producers.

Project location:

- Village of Issari (Chétimari rural district/ Department of Diffa/ Diffa Region)
 - Villages of Edouk I and Edouk II (Kaou rural district/ Department of Tchirozérine/ Agadez Region)
 - Tondikiwindi rural district (Department of Ouallam/ Tillabéri Region)
 - Aderbissanat rural district (Department of Tchirozérine/ Agadez Region)
 - Loga urban district (Department of Loga/ Dosso Region)
-

Sector: Agriculture, cattle breeding , and Forestry.

Justification

In the above-mentioned localities, the rural sector is affected by the climatic restraints (droughts, sandstorms), which led to the lessening of agricultural, forestry and pastoral productions aggravating thus the populations' living conditions. This was emphasized by the weakness of adaptation capacities of rural producers on the material, technical as well as organizational point of view. These producers mainly rely on family production structures and traditional techniques not very productive.

This project aims at remedying this weakness through the organization and training of rural producers in order to deal with the adverse effects of climate changes.

This project "Reinforcement of the material, technical and organisational capacities of the rural producers" is in perfect adequacy with the strategic axis n°3 of the Rural Development Strategy which constitutes the national framework of reference for all the actions of rural development. This axis focuses on the reinforcement of the public institutions and e rural organizations capacities to improve the management of the rural sector.

Overall objective:

Build capacities of rural producers in the project zone to achieve a sustainable development.

Specific objectives:

- Design and implement, by rural producers, mechanisms allowing them to develop their own strategies for a better management of the rural sector;
- Develop and improve peasants' knowledge;
- Build the capacities of rural organizations.

Technical and financial feasibility:*Technical feasibility:*

- Existing of training organizations (technical services, NGOs);
- Existence of organized structures;
- Needs expressed by the populations during field visits;
- The project objectives match the PRS and SDR orientations.

Financial feasibility

- Support from GEF;
- Contribution from the government;
- Contribution from local authorities;
- Contribution from beneficiary communities;
- Presence of other projects and NGOs (PAC, PADL, PPEAP, LUCOP, COGERAT, AZAWAK project, Care International...).

Expected results:

- Infrastructures are rehabilitated, created and developed;
- Processes of decision making for an efficient management of the infrastructures are designed;
- Know-how of rural actors is updated;
- The productivity of agricultural and pastoral systems is improved;
- The incomes of rural producers are increased;
- Farms and other production factors are rationally managed;
- Rural drift is lessened;
- Food and nutritional security of the populations is improved.

Activities:

- Rehabilitation and creation of infrastructures;
- Support for Information, Education and Communication initiatives by rural producers;
- Support for the creation of adequate financing facilities;
- Support for physical and economic accessibility to inputs;
- Monitoring and evaluation.

Project-related risks:

- Delay in cash flow;
- Mobility of certain parties working with the project.

Institutional set-up:

The coordination and the implementation monitoring of the project will be carried out by the National Environmental Council for a Sustainable Development. The implementation will be carried out by the local technical service in collaboration with local management committees.

Monitoring and evaluation:*Monitoring and evaluation indicators:*

- Output growth rate;
- Level of producers' income;
- Number of rural producers trained;
- Number of infrastructures rehabilitated and/ or created.

Monitoring and evaluation mechanisms:

- Field visits will be carried out;
- Intermediate and final report will be required;
- A mid-term review of the project will be made.

Project duration: Two years

6. Elaboration process of the adaptation programme

The process which characterized the NAPA elaboration has been participatory and replicated at the local and central level as well. The NAPA development objective has been to contribute to the alleviation of the adverse effects of climate changes on the most vulnerable populations in the prospect of a sustainable development and fight against poverty in Niger.

6. 1. Contribution from the government

The contribution from the government is mainly about:

- The installation of the National Technical Commission on Climate Changes and Variability (CNCVC);
- Adoption of a strategy on climate changes and its Action Plan ;
- The establishment of the National Coordination;
- The allocation of premises for the National Coordination;
- The establishment of the Running Committee;
- The provision of support staff;
- The setting up of a multidisciplinary team.

6. 2. Consultative process

6. 2. 1. National consultation

The National Consultation has been characterized by a series of meetings with all the actors and the setting up of some task forces. These are:

- The Steering Committee (under the responsibility of the Technical Commission on Climate Change) where all the decisions, especially the validation and adoption of the different documents are made;
- The experts team and task forces which led to the NAPA elaboration;

It should be recalled that some experts, who have contributed to the studies on vulnerability adaptation of the initial national communication, also took part in the NAPA process. They are notably the experts in the sectors of water resources, fishings, wetlands, forestry etc.

- Four concentric circles with actors and stakeholders:
 - The circle of women;
 - The circle of producers and peasants;
 - The circle of NGOs and Associations;
 - The circle of the media, Information, Education and Communication.

The setting-up of concentration circles was based on the areas vulnerability profiles and the adaptation problems at the local and on the groups working in the target areas. The role of these circles has been to give their consultative opinion on issues submitted to them.

In this process four great meetings took place. These are:

- A workshop for the project launching;
- A workshop on adaptation capacity building;
- A workshop for capacity building on the elaboration of selection criteria of priority activities and the wording of adaptation projects;
- The NAPA popularization.

These meetings gathered all the different actors and those at the central level, in order:

- To supply information on the objectives, approaches, activities and expected results of

the NAPA elaboration;

- To build their capacities and inform them on the process of climate changes, the vulnerability and adaptation on climate changes, the synergy with global agreements on environment, the steps of NAPA elaboration and the population consulting on the NAPA process;
- To build capacities on the elaboration of selection criteria of priority activities and on the wording of adaptation projects;
- To validate the project paper.

6. 2. 2 Local Consultation

Consultation carried out by the experts' team and task forces took place in each region, especially in regional capital cities, with the technicians, and administrative and traditional authorities. These consultations were about their perception of climate changes, the adaptation strategies, adaptation needs and measures to be taken to face their adaptation needs. These consultations also allowed the identification of the areas, the populations and the most vulnerable sectors at the regional level. At the level of vulnerable areas, debates took place with the populations, local counselors, specialists and administrative, and traditional authorities in order to record their views on their urgent and immediate needs as regards to adaptation (cf: Reports of field visits).

In the case of NAPA popularization other consultations are planned in these vulnerable areas to see with the population and other actors if their needs have been taken into account.

6.3. Institutional set-up

The priority activities of the NAPA will be under the responsibility of the decentralized services of the Ministries in charge of the sector. These technical services will be supported by the Local Running Committee made up of all the parties working with the projects. They will also collaborate, if necessary, with other organizations and/ or institutions present nationwide.

At the national level, the National Environmental Council for a Sustainable Development, according to its attributions, will coordinate and monitor the implementation of the projects.

6. 4. Monitoring and evaluation

The monitoring and evaluation are characterized by the following basic elements:

- Setting up of indicators which would allow to assess the level of the programme implementation;
- Setting up of a monitoring and evaluation mechanism, especially field visits and (mid-term or final) review accompanied with reports.

6.5. Adoption mechanism by the government

As mentioned above, the NAPA paper is integrated in the main documents of policies and strategies adopted by the government of Niger and passed by the National Assembly. These strategy frameworks included particularly in the PRS (passed in 2002), the SDR (passed in 2003), the strategy related to climate changes and its plan of action (passed in 2004). The NAPA is perfectly within the scope of these policies and strategies

implementation. This led to the support from the government of Niger for its elaboration and implementation. The NAPA paper will then be submitted to the Cabinet meeting for its final ratification.

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APPENDICES

APPENDIX I: LIST OF PRODUCED DOCUMENTS IN THE PROCESS

OF NAPA NIGER

Appendix 1.1: Available information and documents

Appendix 1.2: Relevant complementary information

Appendix 1.3: Report on the elaboration of information and documents analysis grid on the adverse effects of climate variability and changes, and adaptation strategies

Appendix 1.4: Synthesis of existing information on the adverse effects of climate changes and variability

Appendix 1.5: Assessment of extreme weather events in Niger

Appendix 1.6: Elaboration of priority criteria for the identification and ranking of sectors, vulnerable areas and communities

Appendix 1.7: Field visits report on the identification and evaluation of areas vulnerable to adverse effects of climate changes, Tahoua-Agadez axis

Appendix 1.8: Field visits report on concerted evaluation of sectors, areas and communities' vulnerability, Maradi-Zinder-Diffa axis

Appendix 1.9: Field visits report on evaluation of vulnerable areas, Tillaberi Urban Community of Niamey-Dosso axis

Appendix 1.10: Synthesis of concerted evaluation on vulnerability and adaptation

Appendix 1.11: Analysis of strengths and weaknesses of current adaptation measures

Appendix 1.12: Identification of adaptation needs and constraints

Appendix 1.13: Adaptation measures in relation with basic needs

Appendix 1.14: Development of synergies with the post-Rio conventions, policies, strategies, programmes and projects

Appendix 1.15: Synthesis on adaptation measures

Appendix 1.16: Review and evaluation of criteria used in Niger for projects identification, selection and decision

Appendix 1.17: Criteria selection of NAPA priority options

Appendix 1.18: Revision of adaptation options

Appendix 1.19: Selection criteria for adaptation activities

APPENDIX II: LIST OF TABLES

Appendix II.I: Table 1: Variation (in mm), by 2025, of the monthly average normal rainfall between 1961 and 1990

Stations	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	Average	Maxi
Tillabéri	0.0	0.0	0.0	-0.4	-1.6	-2.6	-3.5	-0.5	3.7	1.9	0.1	0.0	-0.2	3.7
Niamey	0.0	0.0	0.1	-0.4	-3.3	-3.7	-5.3	-0.6	4.9	1.7	0.1	0.0	-0.5	4.9
Dosso	0.0	0.0	0.0	-0.1	-2.7	-1.5	1.4	6.8	5.4	2.1	0.1	0.0	1.0	6.8
Konni	0.0	0.0	0.0	-0.1	-2.3	-1.4	1.3	5.5	4.2	1.9	0.0	0.0	0.7	5.5
Tahoua	0.0	0.0	0.0	-0.1	-1.1	-1.1	1.0	4.4	3.1	1.4	0.0	0.0	0.6	4.4
Maradi	0.0	0.0	0.0	-0.1	-1.3	-1.3	1.5	6.0	4.1	1.3	0.0	0.0	0.9	6.0
Agadez	0.0	0.0	0.0	-0.1	-0.4	-0.1	1.3	2.8	0.4	0.0	0.0	0.0	0.3	2.8
Zinder	0.0	0.0	0.0	0.0	-1.0	-0.2	4.9	9.5	2.8	0.9	0.1	0.0	1.4	9.5
Gouré	0.0	0.0	0.0	0.0	-0.6	-0.1	3.5	6.5	2.2	0.2	0.0	0.0	1.0	6.5
Mainé	0.0	0.0	0.0	0.0	-0.5	-0.2	3.8	8.4	2.4	1.5	0.0	0.0	1.3	8.4
Magaria	0.0	0.0	0.0	-0.1	-1.5	-0.3	6.3	10.6	3.8	1.4	0.0	0.0	1.7	10.6
N'guigmi	0.0	0.0	0.0	0.0	-0.3	-0.1	3.0	6.6	0.3	0.1	0.0	0.0	0.8	6.6
Diffa	0.0	0.0	0.0	0.0	-0.6	-0.1	4.2	8.3	0.7	1.2	0.0	0.0	1.1	8.3
Bilma	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.4
Gaya	0.0	0.1	0.1	-0.3	-2.4	-0.1	2.8	6.9	5.7	2.8	0.0	0.0	1.3	6.9

Source: Updated general report on vulnerability and adaptation to climate changes, April 2003

Appendix II.II: Table 2: Variation (in °C), by 2025, of the monthly average normal temperature from 1961 to 1990

Stations	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	Average	Maxi	Mini
Tillabéri	-0.3	-0.4	-0.4	-0.4	0.0	1.0	1.5	1.5	0.9	-0.1	-0.5	-0.6	0.2	1.5	-0.6
Niamey	0.0	-0.1	-0.4	-0.5	0.7	2.2	2.6	2.5	1.9	0.3	0.0	-0.3	0.7	2.6	-0.5
Dosso	-0.9	-0.7	-0.7	-0.2	1.0	2.4	2.6	2.4	2.1	0.7	-0.8	-1.0	0.6	2.6	-1.0
Konni	-0.4	-0.5	-0.3	-0.1	0.6	1.6	2.1	2.3	1.8	0.8	-0.3	-0.6	0.6	2.3	-0.6
Tahoua	0.2	0.1	-0.2	-0.4	0.0	0.9	1.3	1.5	0.7	0.0	-0.4	-0.3	0.3	1.5	-0.4
Maradi	1.6	1.4	1.3	1.0	1.5	2.2	2.9	3.1	2.6	2.1	1.6	1.4	1.9	3.1	1.0
Agadez	1.9	2.1	2.2	1.1	0.0	-0.9	-1.1	-1.0	-1.0	0.5	1.4	1.5	0.6	2.2	-1.1
Zinder	-0.2	-0.2	0.0	0.0	0.2	1.0	1.9	2.3	1.1	-0.2	-0.5	-0.5	0.4	2.3	-0.5
Mainé	0.3	0.3	0.2	0.0	0.3	0.7	1.7	2.1	1.3	0.3	0.0	0.1	0.6	2.1	0.0
Magaria	0.6	0.8	0.9	0.9	1.3	2.0	2.8	2.9	2.3	1.5	0.9	0.5	1.4	2.9	0.5
N'guigmi	1.2	1.4	1.2	1.1	1.0	0.6	0.5	0.8	0.4	0.4	0.6	1.0	0.8	1.4	0.4
Bilma	0.1	0.2	-0.2	-0.6	-0.4	0.1	-0.6	-1.1	-0.2	0.1	0.0	0.0	-0.2	0.2	-1.1
Gaya	0.4	-0.3	-1.4	-2.2	-1.4	-0.6	0.0	0.1	0.0	-0.8	-0.7	0.2	-0.6	0.4	-2.2

Source: Updated general report on vulnerability and adaptation to climate changes, April 2003

Appendix II.III: Table 3: Variation (in Octas), by 2025, of the monthly normal nebulosity from 1961 to 1990

Stations	JAN	FEB	MAR	APR	MAY	JUIN	JUIL	AUG	SEPT	OCT	NOV	DEC	Average
Tillabéri	-1.0	-1.0	-0.8	-0.7	-0.8	0.0	-0.5	-0.3	-0.3	-0.7	-0.9	-1.0	-0.7
Niamey	-0.7	-0.8	-0.7	-0.7	-1.0	-0.1	-0.4	-0.3	-0.6	-0.6	-0.8	-1.0	-0.6
Konni	-1.8	-1.9	-1.6	-1.4	-1.7	-1.5	-1.7	-1.4	-1.5	-1.5	-1.8	-1.8	-1.6
Tahoua	-1.7	-1.7	-1.5	-1.3	-1.6	-1.2	-1.4	-1.2	-1.4	-1.5	-1.8	-1.8	-1.5
Maradi	-1.6	-1.5	-1.4	-1.1	-1.4	-0.8	-1.5	-1.3	-1.3	-1.3	-1.6	-1.9	-1.4
Agadez	-2.2	-2.1	-2.2	-1.6	-2.1	-2.2	-2.3	-1.6	-1.8	-1.9	-2.6	-2.5	-2.1
Zinder	-2.1	-2.4	-2.2	-1.6	-2.2	-2.1	-2.0	-1.6	-2.1	-2.3	-2.8	-2.5	-2.2
Gouré	-1.7	-1.7	-1.5	-0.9	-1.3	-1.4	-1.3	-0.6	-1.2	-2.0	-2.3	-2.6	-1.6
Mainé	-1.6	-1.9	-1.8	-1.2	-1.6	-1.7	-2.0	-1.7	-2.0	-1.7	-1.9	-1.8	-1.7
Magaria	-1.8	-2.4	-1.8	-1.1	-2.0	-1.9	-1.8	-1.2	-1.5	-1.7	-2.0	-2.3	-1.8
N'guigmi	-2.1	-2.2	-1.9	-1.6	-1.7	-1.5	-1.9	-1.7	-1.9	-2.0	-2.4	-2.4	-2.0
Bilma	-2.6	-2.1	-2.3	-1.6	-2.0	-2.0	-2.7	-2.9	-1.7	-1.9	-2.8	-2.7	-2.3
Gaya	-0.4	-0.6	-0.4	-0.1	-0.3	0.2	0.6	1.1	0.8	0.2	-0.2	-0.7	0.0

Source: Updated general report on vulnerability and adaptation to climate changes, April 2003

Appendix IV. II Table 4: *Weighting coefficient given to each criterion*

Criterion	WEIGHTING COEFFICIENT
Impact on the economic growth among the poor	2
Impact on vulnerable groups and resources	6
Avoided losses for the poor	2
Synergy with multi-lateral Environmental Agreements, National projects and programs	2
Cost	6

Appendix V. II Table 5: Options scoring with regards to each criterion

		CRITERIA				
		N°1	N°2	N°3	N°4	N°5
OPTIONS	N°1	4	4	356	9	169
	N°2	3	3	200	7	111
	N°3	4	3	150	6	100
	N°4	3	4	369	6	89
	N°5	3	3	238	4	138
	N°6	4	3	281	8	150
	N°7	2	3	275	8	81
	N°8	2	3	213	7	124
	N°9	2	4	300	6	60
	N°10	4	4	288	5	80
	N°11	2	3	200	5	50
	N°12	3	3	213	7	50
	N°13	4	4	381	8	138
	N°14	3	2	114	6	50
	N°15	4	4	311	7	113
	N°16	4	4	272	5	50
	N°17	3	2	133	3	100
	N°18	3	4	294	5	50
	N°19	3	2	98	4	80
	N°20	4	3	313	3	116

Appendix VI. II Table 6: Standardized total score and average standardized score and ranking of each option with regard to each criterion in the options ranking

		CRETERIA					Total	Average	Ranking
		N°1	N°2	N°3	N°4	N°5			
OPTIONS	N°1	1	1	0.91	1.00	0.00	3.91	0.78	3
	N°2	0.5	0.5	0.36	0.67	0.49	2.51	0.50	14
	N°3	1	0.5	0.18	0.50	0.58	2.76	0.55	11
	N°4	0.5	1	0.96	0.50	0.67	3.63	0.73	6
	N°5	0.5	0.5	0.49	0.17	0.26	1.92	0.38	18
	N°6	1	0.5	0.65	0.83	0.16	3.14	0.63	8
	N°7	0	0.5	0.63	0.83	0.74	2.70	0.54	12
	N°8	0	0.5	0.41	0.67	0.38	1.95	0.39	17
	N°9	0	1	0.71	0.50	0.92	3.13	0.63	8
	N°10	1	1	0.67	0.33	0.75	3.75	0.75	5
	N°11	0	0.5	0.36	0.33	1.00	2.19	0.44	15
	N°12	0.5	0.5	0.41	0.67	1.00	3.07	0.61	10
	N°13	1	1	1.00	0.83	0.26	4.09	0.82	1
	N°14	0.5	0	0.06	0.50	1.00	2.06	0.41	16
	N°15	1	1	0.75	0.67	0.47	3.89	0.78	3
	N°16	1	1	0.61	0.33	1.00	3.95	0.79	2
	N°17	0.5	0	0.12	0.00	0.58	1.20	0.24	20
	N°18	0.5	1	0.69	0.33	1.00	3.53	0.71	7
	N°19	0.5	0	0.00	0.17	0.75	1.41	0.28	19
	N°20	1	0.5	0.76	0.00	0.45	2.71	0.54	12

Appendix VII.II: Table 7: Second options scoring with regard to each criterion

		CRITERIA				
		N°1	N°2	N°3	N°4	N°5
OPTIONS	N°1	4	4	356	9	169
	N°2	3	3	200	7	111
	N°3	4	3	150	6	100
	N°4	3	4	369	6	89
	N°6	4	3	281	8	150
	N°7	2	3	275	8	81
	N°9	2	4	300	6	60
	N°10	4	4	288	5	80
	N°12	3	3	213	7	50
	N°13	4	4	381	8	138
	N°15	4	4	311	7	113
	N°16	4	4	272	5	50
	N°18	3	4	294	5	50
	N°20	4	3	313	3	116

Appendix VIII.II: Table 8: Standardized score, total and average standardized score and ranking of each option with regards to each criterion in the options ranking in the second step

		CRITERIA					Total	Average	Ranking
		N°1	N°2	N°3	N°4	N°5			
OPTIONS	N°1	1,00	1,00	0,89	1,00	0,00	3,89	0,78	2
	N°2	0,50	0,00	0,22	0,67	0,49	1,87	0,37	14
	N°3	1,00	0,00	0,00	0,50	0,58	2,08	0,42	12
	N°4	0,50	1,00	0,95	0,50	0,67	3,62	0,72	6
	N°6	1,00	0,00	0,57	0,83	0,16	2,56	0,51	9
	N°7	0,00	0,00	0,54	0,83	0,74	2,11	0,42	12
	N°9	0,00	1,00	0,65	0,50	0,92	3,07	0,61	8
	N°10	1,00	1,00	0,60	0,33	0,75	3,68	0,74	5
	N°12	0,50	0,00	0,27	0,67	1,00	2,44	0,49	10
	N°13	1,00	1,00	1,00	0,83	0,26	4,09	0,82	1
	N°15	1,00	1,00	0,70	0,67	0,47	3,83	0,77	3
	N°16	1,00	1,00	0,53	0,33	1,00	3,86	0,77	3
	N°18	0,50	1,00	0,62	0,33	1,00	3,46	0,69	7
	N°20	1,00	0,00	0,71	0,00	0,45	2,15	0,43	11

Appendix IX.II Table 9: Standardized average score and ranking of each option with regards to each criterion in the options ranking in the second step after weighting

		CRITERIA					Total	Average	Ranking
		N°1	N°2	N°3	N°4	N°5			
OPTIONS	N°1	1,00	1,00	0,89	1,00	0,00	3,89	0,65	7
	N°2	0,50	0,00	0,22	0,67	0,49	1,87	0,43	13
	N°3	1,00	0,00	0,00	0,50	0,58	2,08	0,58	9
	N°4	0,50	1,00	0,95	0,50	0,67	3,62	0,66	6
	N°6	1,00	0,00	0,57	0,83	0,16	2,56	0,54	11
	N°7	0,00	0,00	0,54	0,83	0,74	2,11	0,40	14
	N°9	0,00	1,00	0,65	0,50	0,92	3,07	0,54	11
	N°10	1,00	1,00	0,60	0,33	0,75	3,68	0,80	2
	N°12	0,50	0,00	0,27	0,67	1,00	2,44	0,60	8
	N°13	1,00	1,00	1,00	0,83	0,26	4,09	0,73	4
	N°15	1,00	1,00	0,70	0,67	0,47	3,83	0,75	3
	N°16	1,00	1,00	0,53	0,33	1,00	3,86	0,87	1
	N°18	0,50	1,00	0,62	0,33	1,00	3,46	0,72	5
N°20	1,00	0,00	0,71	0,00	0,45	2,15	0,56	10	

Appendix X. II Table 10: List of priority options and their ranking

4/24/2006Option	Ranking
Introducing fodder crop species in pastoral areas	1
Creating Livestock Food Banks	2
Restoring basins for crop irrigation	3
Diversifying and Intensifying crop irrigation	4
Promoting peri-urban market gardening and livestock farming	5
Promoting income-generating activities and developing mutual benefit societies	6
Water control	7
Producing and disseminating meteorological data	8
Creating Food Banks	9
Contributing to fight against climate-related diseases	10
Improving erosion control actions (CES/DRS) for agricultural, forestry and pastoral purposes	11/12
Disseminating animal and crop species that are most adapted to climatic conditions	11/12
Watershed protection and rehabilitation of dump-off ponds	13
Building of material, technical and organizational capacities of rural producers	14