



## NATIONAL ADAPTATION PROGRAMMES OF ACTION

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# BANGLADESH

## NAPA PRIORITY PROJECT No 10

### PROMOTION OF RESEARCH ON DROUGHT, FLOOD AND SALINE TOLERANT VARIETIES OF CROPS TO FACILITATE ADAPTATION IN FUTURE

#### TYPE OF PROJECT

Research

#### RATIONALE

Crop agriculture is still the mainstay of the economy and rural workforce in Bangladesh and will be very vulnerable to impacts of climate change in future. Therefore, it will be imperative to develop improved varieties of all types of crops to withstand the potential impacts of climate change such as floods, droughts, high temperature, salinity, etc.

#### DESCRIPTION

##### **Objectives and activities**

To develop new varieties of crops such as rice, wheat etc, to tolerate saline, flood and drought conditions.

##### **Inputs and Activities**

Laboratory facilities (hardware and human resources) for plant breeding in the main crop research institutes in the country

##### **Short-term outputs**

New varieties of salt, drought and flood tolerant crops developed

##### **Potential long-term outcomes**

Flood-prone, drought-prone and salinity-prone areas of the country adopt the new varieties and reduce their vulnerability to climate change impacts.

#### IMPLEMENTATION

##### **Institutional arrangement**

Primary implementing agency: BARC

Secondary implementing agencies: BARI, BRRI, DAE, NGOs

##### **Risks and barriers**

Failure to develop new varieties;

Evaluation and monitoring;

Through a multi-sectoral, multi-stakeholder review committee.

#### COST

An indicative and tentative financial resource estimate for the activities provided below:

*Full project: USD 5,000,000*

*Design phase: USD 50,000*

# BANGLADESH

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## NAPA PRIORITY PROJECT No 11

### PROMOTING ADAPTATION TO COASTAL CROP AGRICULTURE TO COMBAT SALINIZATION

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#### TYPE OF PROJECT

Intervention (with policy, awareness raising and research elements)

#### RATIONALE

A significant part of the coastal area is facing salinity problems due to tidal surge flooding. It is anticipated that salinization and tidal surges would be pronounced under warmer climate particularly due to sea level rise. Therefore crop agriculture needs new approaches and technologies to deal with salinization in the coastal area. No crop is cultivated during Kharif season due to high depth of standing water in the field. Water recedes late from the crop field and keeps soil muddy at the time of appropriate sowing of the next candidate crops. Traditional land preparation is not possible. Affected community needs food, fodder, fuel and feed earlier than the next rice crop (Boro rice, wheat, potato, etc). At this condition the affected communities remain half-fed, ill fed, malnourished and moves to cities or other areas for job and livelihood.

#### DESCRIPTION

##### Objectives and activities

The main objective of the wet bed no-tillage methods maize production is to produce maize, (before next Boro rice crop) for tidal surge flood affected community after loss of Aman rice crop. It will also help to meet fuel and fodder need of the community;

Produce selected vegetables and fruits on raised bed to meet day-to-day demands of the affected households. Some cash is also generated from sale proceed of the vegetables;

Motivate the affected community to adapt the above technologies to combat with coastal inundation due to tidal surge after loss of crops or no crop items.

##### Inputs

- Maize seeds, fertilizers, are the major inputs required;
- Maize harvester/ Sheller would be required;
- Audiovisual appliances for training of the community would be required;
- For supervision of field activities transport would be required.

##### Short-term outputs

- Production of food, fodder, fuel, and feeds needed by he affected community before the next Boro rice and wheat crop;
- Production of fruits and vegetables;
- Meet household's demand for vegetables and fruits partially or fully meet;
- Family nutrition is improved;
- Generate cash by selling output partially Potential long-term outcomes;

- Adoption of the technology would help the community to adapt with flood/ tidal surge and sea level rise;
- Affected community would not migrate to cities for job and livelihood;
- When the Sorjan beds are made it would generate vegetables and fruit continually;
- Social consequences of mass scale migration to cities would to some extent be halted.

### IMPLEMENTATION

#### **Institutional arrangements**

The technology was designed by the On-farm Research Division (OFRD) of BARI. OFRD has a network of field research sites with subprofessional posted at the field level. Professional scientists posted at the district level supervise the field activities. Department of Agricultural Extension (DAE) is mandated for extension of technology, having field workers at village level. Planning and implementation might be responsibility of extension with technical support from OFRD, BARI. Soil Resources Development Institute (SRDI) having professional posted at the district level monitor soil salinity. NGOs are working all over the country. The project might be implemented by DAE. NGOs may also be involved in the implementation of activities. As the technology is of different nature local consultants having background in farming system might be required for successful implementation of the activity. BARC may do the overall coordination of the project during implementation stage.

Primary implementing agency: BARI?

Secondary implementing agencies: DAE, SRDI, NGOs

#### **Risks and barriers**

The community should be organized to join the production system in a contiguous large block. Otherwise protection of the crop from birds and jackal would be difficult. Moreover, cobs from a single isolated plot are likely to be stolen by the children. This may also cause social problem. Other than these no risk and barriers were noticed while designing the technology.

#### **Evaluation and monitoring**

- This is not a traditional type of technology. Thus it would require constant technical supervision in the field in all stages of production to develop the intended benefit;
- An independent multidisciplinary team should be formed by BARC for monitoring and evaluation of the activities to assess performance of the technology in generating the intended benefits.

### COST

- As mentioned above this is not a traditional technology. The project would require services of project staff and local consultants;
- Production cost depends on the size of field block (tentatively 5 ha blocks of 10 farmers in clusters) and their number (tentatively 1000 clusters);
- Farmers and the sub professional at the field level would require training on the concept and production/ harvesting packages of the technology;
- Audiovisual aid would be needed for the training activities;
- Sufficient number of field days would be required to disseminate the technology;
- Rapid appraisal would be required to identify specific location and communities;



- Detail planning may estimate demand on the financial resources;
- Demand of financial resources would depend on size of the sorjan beds and the total number that would be replicated. Detail costing may be worked out during detail planning and implementation.

An indicative and tentative financial resource estimate for five years is provided as below:

*Full Project: USD 6,500,000*

*Project design: USD 50,000*

# BANGLADESH

## NAPA PRIORITY PROJECT No 12

### ADAPTATION TO AGRICULTURE SYSTEMS IN AREAS PRONE TO ENHANCED FLASH FLOODING–NORTH EAST AND CENTRAL REGION

#### TYPE OF PROJECT

Intervention (with policy, awareness raising and research elements)

#### RATIONALE

North east and central regional of the country are prone to flood and will become more prone under anticipated future climate change. Crop field and homesteads are inundated by flood, crops and seedlings are damaged/lost, water recession is delayed, water logging is prolonged, community needs immediate and/or early harvest of vegetables before a regular vegetable crop. Therefore crop agriculture need new approaches and technologies to deal with flood. No crop is cultivated during Kharif season due to high depth of standing water in the field. Water recedes late from the crop field and delay time of appropriate sowing of the next candidate crops. Traditional land preparation is not possible. Affected community needs food, fodder, fuel and feed earlier than the next rice crop (Boro rice, wheat, potato, etc). At this condition the affected communities remain half-fed, ill fed, malnourished and moves to cities or other areas for job and livelihood.

#### DESCRIPTION

##### Objectives and activities

- The main objective of the no-tillage methods potato cultivation is to produce staple food, (before next Boro rice crop) for flood affected community after loss of Aman rice crop;
- Produce selected vegetables to meet day-today demands of the affected households. Some cash is also generated from sale proceed of the vegetables;
- Motivate the affected community to adapt the above technologies to combat with inundation due to flood after loss of crops or no crop items.

##### Inputs

- Potato seeds, fertilizers and mulch material are the major inputs. The mulch material like water hyacinth is available after the flood;
- Seeds and some fertilizer are needed;
- The floating substratum is made of water hyacinth, which is available during flood.

##### Short-term outputs

- Produce potato and cash by selling potato to meet the needs of the flood-affected community. Potato at the rate of 18-20 t/ha is obtainable from the production system;
- Produce vegetables to meet day-to-day requirement of the affected community;
- Generate continuous supply of nutrition;
- Generate cash by selling the vegetables. Potential long-term outcomes;
- This is a contingency option for the flood affected community. In the long-term people might get a means to continue with farming, instead of migrating to cities

after the flood. This would to some extent reduce social problems of migration of the distressed community to cities;

- The system, as because require almost no cost, is suitable for the distressed community to adapt. Thus it is likely that the community would continue to adopt the adaptation tool;
- The production system is a potential source of nutrition from the vegetables, which the distressed community very often suffers from especially at the time of flooding.

### IMPLEMENTATION

#### **Institutional arrangements**

The technology was designed by the On-farm Research Division (OFRD) of BARI and tested in different agroecosystems. OFRD has a network of field sites in the vulnerable areas with sub professional posted at the field level. DAE is mandated to transfer technology with sub professional posted at the village level. The two groups of workers may jointly implement the production system. DAE will have the lead role. SRDI monitor the soil fertility and salinity. SRDI may also be included in implementation of the activity. The targeted areas are not traditionally potato growing. Potato seeds are not locally available. Seed tuber and fertilizer cost is high. Affected community would need credit for the purpose of cultivating the crop. Thus, other than OFRD, BARI, DAE, SRDI, BADC Krishi Bank and NGOs have to be included in the implementation of the programme. BARC should be in charge of overall coordination of the project. A mechanism has to be developed. Implementation of the activity might require services of local consultant having background in farming systems. Although the floating bed technique of vegetable production is a farmers' practice, scientists from OFRD, BARI attempted to refine it to be more productive and profitable. A team of researcher and extension official joined by NGOs might extrapolate the technology. Implementation of the activity might require services of local consultant having background in farming system.

Primary implementing agency: BARI (OFRD)

Secondary implementing Agencies: DAE, SRDI, KB, NGOs

#### **Risks and barriers**

- During design stage of the technology no other risk except rodents making holes beneath the mulch was noticed. The rodents can be controlled with available crop production practices;
- Potato seeds in the flood affected areas especially in the northeastern areas are not normally available because these areas are not traditional potato growing areas. Government or NGOs would have to take initiatives to deliver the potato seeds at the farmers door step;
- The crop would require sufficient mulch material;
- During the design stage peoples expressed mixed reaction about the technology because it was not targeted to flood-affected community;
- Affected community need to be motivated to adapt the technology.

#### **Evaluation and monitoring**

As the technology is different from the traditional ones it will require services of local consultants preferably from the group of scientists who designed it. Close and constant monitoring during the implementation will be required in the field.

An independent monitoring team of the professionals from research and extension would be necessary to monitor and evaluate performance of the technology. BARC would form a multidisciplinary monitoring and evaluation team.

#### COST

- The technology would require high cost of production because of high cost of seeds (60%). Total cost would depend on the block size (preferably 5 ha each of 10 farmers) in one hand and the number of such blocks (1000 block).
- This can be worked out when there is policy decision on size of unit block and number of such block.
- Farmers and sub professionals at the field level would require training on the concept and production package of the technology.
- Audiovisual aids would be needed for the training activities.
- For dissemination of the technology sufficient field days would be necessary.
- A comprehensive budget has to be worked out for the purpose.
- Total cost will depend on size of the unit bed preferably one meter in breadth and 4 meter in length) having 20 such bed in a cluster and 1000 such clusters.
- Sufficient number of field days has to be organized to explain the merit of the technology so that more farmers adopt the technology.

An indicative and tentative financial resource estimate for five years is provided as below:

*Full project: USD 6,500,000*

*Project design: USD 50,000*

# BANGLADESH

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## NAPA PRIORITY PROJECT No 13

### ADAPTATION TO FISHERIES IN AREAS PRONE TO ENHANCED FLOODING IN NORTH EAST AND CENTRAL REGION THROUGH ADAPTIVE AND DIVERSIFIED FISH CULTURE PRACTICES

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#### TYPE OF PROJECT

Intervention (with research, policy and awareness raising elements)

#### RATIONALE

Flood is an annual phenomenon in Bangladesh. However, recent experiences show that both frequency and intensity of flood has increased and every year many parts of the country is devastated by floods, often causes losses to agricultural crops, livestock and other assets. Every year hundreds and thousands of culture ponds float due to floods resulting in the loss of fish and the poor fish farmers incur financial losses. Sometimes, they are assisted by the government under the after-flood rehabilitation programs. However, this is not a long-term solution to the problem. Therefore, adaptation to the changing hydrodynamic phenomena should be developed and practiced in order to avoid or reduce the devastating effect of floods. The projected increase in rainfall will further aggravate the situation. Presently, culture fisheries contribute more than 50% to the total fish production from inland waters in the country and are mainly represented by pond culture of fish. Sometimes, as an adaptive effort some farmers are used to increase the height of pond dykes and/or put fence around the pond in order to protect their fish from escaping. However, this is not widely practiced. Increasing height of pond dyke above the flood level is usually not cost-effective. Promotion of net and other fencing remains as viable option for protecting fish from floating and thus could reduce the fish crop loss.

#### DESCRIPTION

##### **Objectives and activities**

The overall objective of the activity is to reduce the fish crop loss from increased flooding and promote adaptive viable options for fish culture suitable for the flood prone areas of Bangladesh.

However, the specific activities would be:

- promote/introduce net fencing of ponds to prevent escaping of fishes from culture ponds;
- promote pen and cage culture of fish in floodplain areas during flood season with as an alternate option for fish culture.

##### **Inputs**

Inputs will be required in the form of transportation, production of awareness and training materials, awareness creation activities, organizing training programs, demonstration of pen and cage culture techniques and net fencing, etc.

##### **Short-term outputs**

- Protection to flood vulnerable culture ponds and other culture facilities will be afforded which in-turn will ensure the financial benefits to fish farmers;

- Fish production from floodplain areas will be increased through promotion of pen and cage culture practices.

#### **Potential long-term outcomes**

- Socio-economic condition of the marginal farmers will be improved with more contribution to GDP;
- Adaptation strategies to increased floods is likely to be replicated in other flood vulnerable areas of Bangladesh resulting in the positive impact on fish production;
- Rehabilitation programs for culture fisheries after floods will not be required;
- Adaptation to floods will be achieved.

### **IMPLEMENTATION**

#### **Institutional arrangements**

Department of Fisheries (DoF): DoF should be the implementation agency and should coordinate the all project activities, organize trainings, producing awareness materials. Fisheries Office at the Upazila level should directly be involved with field level implementation and supervising NGO activities.

NGO: Local NGOs could be engaged by DoF to carry out specific activities, like survey of ponds, promotional activities at the field level and mobilizing fish farmers.

Bangladesh Fisheries Research Institute (BFRI): BFRI could be employed for conducting research and impact assessment.

Primary implementing agency: DOF

Secondary implementing agencies: FRI, NGOs

#### **Risks and barriers**

Cost-effectiveness may determine the adoption of the practice. The landlords may take up pen culture practice. Replication of the practice would depend on the outcomes of the project and government willingness.

#### **Evaluation and monitoring**

The project progress should be monitored and evaluate internally on a quarterly basis by the project. Subsequently, technical and financial progress should be monitored and evaluated on a half yearly basis through BARC and donor agency team. Participatory monitoring could also be done involving the local community in the process.

### **COST**

An indicative and tentative financial resource estimate for the activities provided below:

<p><i>Full Project: USD 4.5 million</i></p> <p><i>Project design: USD 50,000</i></p>
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# BANGLADESH

## NAPA PRIORITY PROJECT No 14

### PROMOTING ADAPTATION TO COASTAL FISHERIES THROUGH CULTURE OF SALT TOLERANT FISH SPECIAL IN COASTAL AREAS OF BANGLADESH

#### TYPE OF PROJECT

Intervention (with awareness raising and policy elements)

#### RATIONALE

Sea level rise and tidal surges will increase salinity of the coastal area and inward intrusion. Some area of the coastal area is already facing problems related to salinity. In spite of the shift in the biodiversity from freshwater species to salt water species, fisheries resources as a whole will have positive impacts from the climatic change in the area. The reason is that higher water levels and higher temperature regimes would lead higher productivity of the fisheries resources. However, individual coastal aqua farmers would need to adapt their culture practice to cope with more flooding with the sea water to get the best benefit of the higher productivity. Regional Consultation Workshops identified salinity problem and suggested to introduce and extend coastal aquaculture, predominantly with saline water fish species and shrimp. The activity is also complementary to the strategic plan and National Fisheries Policy. Although environmental issues are often raised, yet with the changing climatic scenario coastal aquaculture would be viable and pragmatic option.

#### DESCRIPTION

##### Objectives and activities

The overall objective of the project is to utilize the saline waters of the coastal areas to boost up fish production. However, the specific objectives of the project would be to:

- Develop culture technology for salt tolerant fish species having potential for use in coastal aquaculture;
- Piloting and promotion of developed aquaculture in the priority areas of coastal region;
- Develop linkages with weather forecasting agencies through networking;
- Helping the coastal aquafarmers, particularly the shrimp farmers, in protecting the crops from floods.

##### Inputs

- Collection of geo-morphological, meteorological and hydrological data: A wide range of data will be collected on the above areas with a view to understand the causes and effect salinity intrusion. These data will be used to build some predictive.
- Zoning of the coastal belt based on the predicted extent and intensity of salinity intrusion: Based on the collected information, the coastal belt will be divided into a number of zones depending on the extent and depth of inundation and timing of inundation by saline water. The purpose of zoning would be to formulate fisheries or aquaculture strategies suitable for each of the zones.
- Develop culture packages for a number of potential salt tolerant fish species to be used in different identified zones of the coastal belt: A number species suitable for

culture at different salinity regimes and at different depths, representing different identified zones. The culture period should be short. Appropriate technology for their propagation and farming will be developed. Emphasis will be given on the pond and pen culture of fish.

- Piloting of culture technology in limited area in a priority zone: The developed technology will be piloted in order to adjust to local conditions. This piloting will be done in small area of a prioritized area of the coastal belt.
- Promotion of piloted culture practices in a prioritized zone of the coastal area: Extension activities will be undertaken to boost up the developed and piloted culture practices in a highly prioritized zone of the coastal belt.
- Identify the threats in existing shrimp farms and recommend remedies to mitigate the threats: Many existing shrimp farms are presently subjected to tidal surge and floods resulting in crop loss. Threats from all potential sources would be identified and assessed and possible mitigation measures will be recommended.
- Suggest potential new areas for shrimp culture within coastal areas: Analyzing the data collected through the project new potential areas for shrimp culture will be identified.
- Undertake promotional activities for shrimp culture: Promotional activities like farmer contact, providing training, counselling, booklet and poster production, providing some inputs to farmers, organizing rallies, hatchery development etc. could be undertaken.
- Disbursement of livelihood support fund: Fund will be disbursed to most vulnerable section of people, particularly vulnerable women for undertaking AIG activities.

#### Short-term outputs

- Development of a comprehensive database on the geo-morphological, ecological, biological, meteorological and hydrological information of the coastal area of Bangladesh;
- Development of culture technology for a number of fin fish species suitable for culture in shallow saline waters;
- Expansion of aquaculture in the area vulnerable to climate change;
- Increased production of fish and shrimp.

#### Potential long-term outcomes:

- Culture practices replicated and fish production increased;
- Socio-economic of the coastal people improved.

### IMPLEMENTATION

#### Institutional arrangement

Bangladesh Fisheries Research Institute (BFRI):

BFRI will undertake all data collection activities, development of culture technologies, piloting of the technologies, identification of suitable culture areas and training to farmers.

Primary implementing agency: Department of Fisheries (DoF)

Secondary implementing agencies: FRI, NGOs

#### Risks and barriers

- Past information about meteorological parameters, biophysical parameters, etc. may not be readily available as per necessity of the project;



- Appropriate personnel to make a CBEC committee may or may not be available;
- Uncertainty of local salt and aqua farmers' cooperation;
- Guarding against poaching/theft of experimental fish may not work properly;
- Severe cyclonic storm may damage the experimental enclosure fully or partly.

**Evaluation and monitoring**

Evaluating and monitoring authority: Bangladesh Agricultural Research Council and/or financial support provider

Frequency of evaluation and monitoring: Half Yearly and Annually

Type of evaluation and monitoring: Both financial and physical

Method of evaluation and monitoring: Progress report, workshop presentation and field visits.

**COST**

An indicative and tentative financial resource estimate for five years is provided as below:

*Full project: USD 4 million*

*Project design: USD 50,000*

# BURKINA FASO

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## NAPA PRIORITY PROJECT 2

### SÉCURISATION DE LA PRODUCTION CÉRÉALIÈRE PAR LA PROMOTION DE L'IRRIGATION DE COMPLÉMENT DANS LES PROVINCES DE L'OUDALAN ET DU NAMMEMTENGA.

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#### 1. JUSTIFICATION

Au Burkina, l'agriculture pluviale, occupe près de 90 % de la population active et contribue pour plus de 40% à son produit intérieur brut. En ce qui concerne le mil et le sorgho, les superficies emblavées chaque année varient entre un million deux cent mille et un million six cent mille hectares avec des rendements souvent inférieurs à 800 kg/ha. Cette agriculture, tributaire du caractère aléatoire du climat, a des performances rendues médiocres par des systèmes de production extensifs dominés par des techniques et méthodes peu efficaces. Parmi les catastrophes naturelles, les sécheresses sont les plus fréquentes au Burkina Faso. Cette situation rend vulnérable la majorité de la population au changement et à la variabilité du climat.

Avec l'irrigation de complément associée à un niveau d'intensification compatible, on peut garantir le triple des rendements à l'hectare. Par conséquent il est recommandé de prendre en considération le développement de l'irrigation de complément comme stratégie de renforcement des capacités d'adaptation. A cet effet, il est indispensable non seulement de valoriser les points d'eau disponibles, mais également de construire de petits réservoirs capables de mobiliser l'eau nécessaire pour l'irrigation de complément. Un système d'irrigation par aspersion composé d'une motopompe et des rampes (tubes ABC) transportables par les producteurs pourra assurer en temps réel le complément d'eau pour enrayer le déficit hydrique engendré par les poches de sécheresse durant la saison des pluies.

Il existe dans le pays des structures de formation et de recherche dans le domaine de l'agriculture irriguée et de la maîtrise de l'eau, capables d'assurer la mise en oeuvre et le suivi technique d'une telle activité.

Le développement de l'irrigation de complément va contribuer à la sécurisation de la production agricole, à l'intensification de manière à limiter les cultures extensives et donc la dégradation de l'environnement.

Le projet proposé ici vient renforcer les projets en cours dans les régions Nord et Centre Nord. Il s'agit du Programme de développement de la petite irrigation villageoise qui concerne les deux régions, le Projet de développement rural intégré du Namemtenga et le Programme fonds de l'eau et de l'équipement rural phase II, spécifique à la zone du Centre Nord.

#### 2. DESCRIPTION

##### **Objectif global**

Renforcer les capacités d'adaptation des populations en accroissant et sécurisant durablement les productions céréalières par l'irrigation de complément.

### Objectifs spécifiques

- Multiplier les petits réservoirs capables d’approvisionner l’eau pour l’irrigation de complément;
- Intensifier et diversifier les productions de céréales en cultures pluviales et les rendre durablement plus productives;
- Produire une grande masse végétale (résidus de récolte) destinée aux animaux et renforcer le cycle de production de la fumure organique.

### Activités

- Sélectionner les sites d’intervention selon des critères de vulnérabilité clairement définis;
- Organisation d’ateliers d’informations et de sensibilisation sur les objectifs du projet et l’implication des acteurs locaux et des bénéficiaires (producteurs et productrices, ONGs, Services techniques locaux);
- Identifier sur une base participative des parcelles de démonstration et les variétés de mil, sorgho et maïs à tester;
- Construire des réservoirs hydriques;
- Aménager sommairement des parcelles;
- Renforcer les capacités des producteurs.

### Résultats immédiats

- 100 ha sont aménagés pour permettre l’irrigation de complément;
- Les rendements augmentent de façon significative dans les parcelles tests des paysans pilotes;
- Les contraintes de production en irrigation de complément sont identifiées et des solutions proposées en temps réel;
- Des informations agro climatiques, techniques et socio-économiques pour alimenter les banques de données agricoles nationales et régionales sont disponibles;
- Les capacités d’adaptation des producteurs pilotes sont améliorés.

### Résultats à moyen et long terme

- Les cultures pluviales sont sécurisées par l’irrigation de complément sur une surface minimale allouée à chaque ménage;
- Des techniques appropriées et durables d’arrosage pour différentes conditions pédo-climatiques et socio-économiques sont adoptées.

### 3. MISE EN OEUVRE

Le projet sera exécuté en collaboration avec les organisations de producteurs, la Direction Générale de l’Hydraulique Agricole (DGHA), la Direction de la Vulgarisation et la Recherche Développement (DVRD) et l’Institut de l’Environnement et de Recherches Agricoles (INERA).

**Intrants** (ressources financières, ressources humaines, équipements, déplacements)

- Les ressources humaines disponibles dans les structures de recherche, les services de vulgarisation et les ONGs seront renforcées par le recrutement d’un technicien par site;
- Un véhicule tout terrain pour assurer la liaison entre les sites du projet et une moto par site pour le suivi des parcelles et des champs;
- Des motopompes pour les irrigations par aspersion des champs;

- Des tubes ABC, des asperseurs et accessoires pour l'installation d'un système d'irrigation par aspersion mobile (5.000 à 10.000 m<sup>2</sup> par site)

Les différentes étapes de la démarche sont les suivantes:

- Faire un bilan des techniques disponibles dans le pays et dans la sous région pour des conditions climatiques similaires et établir ou actualiser le recueil de fiches techniques de référence en utilisant les résultats disponibles (INERA, PSSA, EIER/ETSHER, SNRA des pays voisins);
- Définir des critères d'évaluation et d'impact;
- Choisir des sites selon leur représentativité, leur accessibilité, la facilité de créer des réservoirs hydriques et compte tenu des autres composantes complémentaires du projet en cours (dispositif de mesures hydrométéorologiques);
- Etablir une situation de base ou de référence;
- Constitution de l'équipe pluridisciplinaire et répartition des tâches (implication des organisations paysannes et des structures de mise en valeur);
- Constitution des équipes de suivi (facilitateurs, enquêteurs, techniciens), de mise en oeuvre des tests et d'appui aux producteurs sur les périmètres retenus;
- Formation des facilitateurs, enquêteurs, techniciens;
- Commande, mise à disposition et bon fonctionnement des équipements de collecte de données sur le terrain.

#### **Arrangements institutionnels**

La mise en oeuvre de ce programme suppose l'implication des producteurs et des services d'encadrement. Le volet recherche d'accompagnement et le transfert participatif des technologies sera assuré par l'Institut de l'Environnement et de Recherches Agricoles (INERA) avec l'appui des structures de vulgarisation et les ONGs en place.

#### **Risques et obstacles**

La mise en oeuvre du projet et l'atteinte des objectifs peuvent être entravées par: l'insuffisance des ressources humaine qualifiées; le faible niveau de participation effective de l'ensemble des acteurs; la lenteur des procédures comptables et administratives; le financement tardif du projet et les catastrophes naturelles extrêmes.

### 4. SUIVI ET ÉVALUATION

#### **Suivi des activités**

Pour le suivi évaluation, les structures existantes seront mises à profit. Il s'agit: au plan local du CCTP; au plan national la Direction des Etudes et Planification des Ministères techniques impliqués. En effet, le suivi sera assuré par un comité de pilotage composé du MAHRH (SP/CPSA, DEP), de la DRED, du CNRST/INERA, de la Direction Générale du Génie rural et entre autres du SP/CONEDD.

#### **Evaluation de la mise en oeuvre**

Le comité de pilotage, dirigé par le SP/CONEDD, va désigner des personne ressources pour l'évaluation à mi-parcours et à la fin du projet.

### 5. RESSOURCES FINANCIÈRES

**Tableau I: Proposition budgétaire pour la mise en oeuvre dans trois sites (en \$ US)**

	Année 1	Année 2	Année 3	TOTAL

Equipement	35 000	0	0	35 000
Construction de réservoirs et aménagement de parcelles	120 000	120 000	0	240 000
Salaire	11 000	11 000	11 000	33 000
Organisation et mise en oeuvre des formations	30 000	25 000	25 000	80 000
Production de documents	200	400	600	1 200
Frais de gestion et imprévus	9 810	7 820	1 830	19 460
<b>TOTAL</b>	<b>20 6010</b>	<b>164 220</b>	<b>38 430</b>	<b>408 660</b>

# BURKINA FASO

## NAPA PRIORITY PROJECT 4

### PRODUCTION FOURRAGÈRE ET CONSTITUTION DE STOCKS DE SÉCURITÉ POUR LE BÉTAIL DANS LE SAHEL BURKINABÉ

#### 1. JUSTIFICATION

Au Burkina Faso, l'alimentation des ruminants domestiques est basée sur l'exploitation extensive des ressources fourragères spontanées (pâturages naturels et jachères). Pendant la saison des pluies, la production fourragère, abondante et de qualité, couvre les besoins d'entretien et de production des animaux. En saison sèche par contre, la production fourragère herbacée est faible et de mauvaise qualité. Ainsi, les besoins même d'entretien des animaux ne sont pas couverts et cela en dépit de l'existence des ressources fourragères additionnelles constituées par les pailles de céréales et les fanes de légumineuses. Dans la plupart des villages situés en zones sahéliennes et nord-soudaniennes, les ressources fourragères couvrent seulement 25 à 50 % des besoins alimentaires du cheptel (Morou 2002; Diouf, 2002; Rippstein, Diouf, 2003). Les catégories d'animaux les plus affectées par cette « période de soudure » sont ceux en production (lait, viande ou travail) et les jeunes en croissance dont on souhaite préserver les capacités futures de reproduction. Cette situation est aggravée lors des années de sécheresses, avec un accroissement des mouvements de transhumance et des mortalités.

Parmi les facteurs responsables du déficit fourrager et nutritionnel, la péjoration climatique occupe une place importante. En effet, la diminution de la pluviosité et l'augmentation de la température affectent négativement la productivité et la valeur nutritive des ressources fourragères.

En vue de sauver les animaux et de garantir une production animale durant les périodes de crises fourragères (saison sèche et sécheresse notamment), il est urgent de mettre en place des stocks alimentaires de sécurité pour le bétail. Un programme est déjà engagé par le Ministère des Ressources Animales pour la promotion de la fauche et conservation des fourrages naturels et pour l'approvisionnement en SPAI des régions affectées par la sécheresse. Toutefois, les actions en cours méritent d'être renforcées (augmentation des capacités de stockage au niveau local, élargissement aux autres catégories fourragères, augmentation du nombre d'éleveurs touchés par le programme) pour préserver une grande partie du bétail contre les effets néfastes des changements et de la variabilité climatique.

#### 2. DESCRIPTION

##### **Objectif global**

Renforcer les capacités d'adaptation des éleveurs aux effets néfastes de la variabilité et des changements climatiques sur l'élevage.

##### **Objectifs spécifiques**

- Appuyer les éleveurs dans la constitution de stocks alimentaires pour le bétail;
- Maintenir les animaux en vie et/ou en production pendant les périodes de crise fourragère (saison sèche, sécheresse).

### Activités

- Informer et sensibiliser les producteurs sur les effets néfastes de la variabilité et des changements climatiques;
- Entreprendre la fauche, le fanage, la mise en bottes et la conservation des fourrages naturels;
- Collecter, conditionner et conserver les résidus de récolte (paille de céréale, fanes de légumineuses);
- Produire du fourrage à partir de soles fourragères (cultures à double objectif) et/ou de jachères fourragères, incluant des technologies agroforestières;
- S'approvisionner en sous-produits agro-industriels (SPAI);
- Mettre en place des équipements de fauche, de conditionnement et de transport des fourrages;
- Construire des infrastructures de stockage, individuelles et collectives (fenils, magasins de stockage);
- Organiser des concours du meilleur producteur de fourrage;
- Mettre en oeuvre un système de suivi des ressources fourragères;
- Renforcer les capacités des agents techniques et des producteurs en techniques de conservation et de gestion des stocks alimentaires pour le bétail.

### Contributions

Assistance technique et financière, équipement et appui institutionnel.

### Résultats à court terme

- Des stocks fourragers de bonne qualité et de SPAI sont constitués;
- Des animaux sont maintenus en vie durant la saison sèche et les sécheresses;
- La production laitière et de viande est augmentée en saison sèche;
- Les animaux de trait sont bien nourris pour faire face aux travaux agricoles en début de saison pluvieuse;
- La production de fumier de qualité est améliorée et la fertilité des terres agricoles est mieux gérée (déjections animales, jachères améliorées);
- La surexploitation des ligneux fourragère est réduite;
- Le revenu des éleveurs est augmenté;
- Les capacités des éleveurs en gestion des stocks alimentaires du bétail sont renforcées.

### Effets potentiels à long terme

- Les systèmes d'élevage sont intensifiés;
- Les mouvements de transhumance sont réduits;
- Les conflits entre les éleveurs et les autres usagers des ressources naturelles sont réduits;
- La contribution du secteur de l'élevage à la croissance de l'économie nationale est accrue.

### 3. MISE EN OEUVRE

#### Arrangements institutionnels

Le projet sera mis en oeuvre par la Direction Générale de la Production Animale (DGPA) du Ministère des Ressources Animales, en collaboration avec les organisations d'éleveurs et le Ministère de l'Environnement et du Cadre de Vie (MECV).

#### Risques et obstacles

Il y a un risque de dégradation de la biodiversité et de disparition des graminées fourragères d'excellente qualité, si l'opération n'est pas conduite selon les principes de gestion rationnelle des pâturages naturels.

### 4. SUIVI-ÉVALUATION

Le suivi du projet sera assuré semestriellement par un Comité de pilotage regroupant les représentants des acteurs concernés. Une réunion annuelle de bilan et de programmation des activités sera également organisée. Une évaluation externe sera réalisée à mi-parcours et en fin de projet.

### 5. RESSOURCES FINANCIÈRES

*USD 330 000*

#### Budget détaillé

<b>Activités</b>	<b>Année 1</b>	<b>Année 2</b>	<b>Année 3</b>	<b>TOTAL</b>
<i>A. Production fourragère et constitution de stocks alimentaires</i>	10 000			10 000
Acquisition de semences fourragères et d'intrants agricoles	50 000			50 000
Équipement en matériel de fauche, de conditionnement et de transport des fourrages	50 000			50 000
Appui à la mise en place d'infrastructures de stockage (fénils, magasins de SPAI)	50 000			50 000
Mise en place d'un fonds de roulement SPAI	30 000	30 000		30 000
<b><i>Sous-total</i></b>	<b><i>140 000</i></b>	<b><i>30 000</i></b>		<b><i>170 000</i></b>
<i>B. Renforcement des capacités</i>				
Formation des éleveurs en gestion des stocks alimentaires du bétail	10 000	10 000	10 000	30 000
Appui institutionnel (achat de véhicule, fournitures de bureau et consommables informatiques, etc.)	40 000	10 000	10 000	60 000
Mise en place d'un système de suivi des ressources fourragères	30 000	20 000	20 000	70 000
<b><i>Sous-total</i></b>	<b><i>80 000</i></b>	<b><i>40 000</i></b>	<b><i>40 000</i></b>	<b><i>160 000</i></b>
<b>Total (A+B)</b>	<b>220 000</b>	<b>70 000</b>	<b>40 000</b>	<b>330 000</b>



# BURKINA FASO

## NAPA PRIORITY PROJECT 7

### DÉVELOPPEMENT DES CULTURES IRRIGUÉES DANS LES PROVINCES DU GOURMA, DU NAMEMTENGA, DE LA TAPOA ET DU SANMATENGA.

#### 1. JUSTIFICATION

Au Burkina, l'agriculture occupe près de 90 % de la population active. Elle est tributaire du caractère aléatoire du climat. Cette situation rend vulnérable la majorité de la population. La performance des cultures irriguées renforce les capacités d'adaptation et rentabilise les lourds investissements réalisés pour la mobilisation et la distribution de l'eau.

Par conséquent le renforcement des capacités d'adaptation passe par la sécurité alimentaire du pays (accroissement et stabilisation de la production). La lutte contre la pauvreté des populations impose de prendre en considération la promotion de l'irrigation comme stratégie complémentaire à toutes les actions de développement agricole. A cet effet, il est indispensable non seulement de créer des aménagements hydro-agricoles, mais également d'assurer leur exploitation performante et leur durabilité. Environ 24 000 ha sont actuellement aménagés dont 18 000 ha en maîtrise totale de l'eau, ce qui représente environ 11 % du potentiel des terres irrigables.

Il existe dans le pays des structures de formation et de recherche dans le domaine de l'agriculture irriguée et de la maîtrise de l'eau. C'est le cas l'Ecole Inter-Etats des Ingénieurs de l'Équipement Rural (EIER), de l'Ecole des Techniciens Supérieurs de l'Hydraulique et de l'Équipement Rural (ETSHER) toutes situées à Ouagadougou et spécialisées dans la formation des ingénieurs et techniciens de l'équipement rural, donc de génie rural (GR). On peut également citer l'Institut du Développement Rural (IDR) de l'Université Polytechnique de Bobo-Dioulasso qui forme des ingénieurs agronomes.

Les recherches menées sur les cultures irriguées depuis le début des années 1970 par l'INERA, ont permis de produire de nombreuses variétés, ainsi que des paquets technologiques performants, pour différentes cultures irriguées au Burkina (riz, maïs, cultures maraîchères, etc.) ou en irrigation de complément (maïs, sorgho, coton). Ces acquis méritent d'être valorisés en vue de renforcer les capacités d'adaptation des populations.

Divers projets ou programmes de développement (le Projet Petite Irrigation Villageoise, Projet sensibilisation des paysans autour des barrages, Projet Spécial Sécurité Alimentaire (PSSA),...) ou institutions de recherche intervenant ou ayant intervenu dans le pays dans le domaine de l'hydraulique agricole ont également produit de nombreux résultats. L'optimisation de l'irrigation augmente la disponibilité de l'eau et limite la dégradation des sols.

#### 2. DESCRIPTION

##### **Objectif global**

Valoriser les ressources en eau pour une agriculture durable, productive, diversifiée, et rentable.

##### **Objectifs spécifiques**

- Accroître la disponibilité de l'eau et des superficies irrigables;
- Intensifier et diversifier les productions agricoles irriguées, et les rendre durablement plus productives;

- Réduire la pollution des eaux de surface et des eaux souterraines par une gestion intégrée de l'irrigation, de la fertilisation et des pesticides.

#### Activités

- Organiser des ateliers d'information et de sensibilisation sur les objectifs du projet avec l'implication de tous les acteurs et bénéficiaires;
- Mettre en place des parcelles de tests des technologies de gestion de l'eau dans les périmètres des sites retenus;
- Renforcer les capacités des producteurs dans les techniques de gestion de l'eau à la parcelle;
- Sensibiliser les producteurs, à travers les tests agronomiques, sur l'importance d'une gestion efficace et durable de l'eau, du sol et des nutriments en cultures irriguées;
- Évaluer les quantités d'eau réellement apportées sur un échantillon des parcelles par des interviews et des mesures directes de terrain;
- Identifier les nouvelles contraintes de production;
- Mettre en place les comités d'irrigants.

#### Résultats immédiats

La pratique des arrosages par les producteurs est bien analysée. Les besoins en eau des principales cultures dans trois zones agroclimatiques sont mis à jour; Les producteurs sont sensibilisés et formés sur la bonne gestion de l'eau à la parcelle et de la fertilisation raisonnée; Les rendements augmentent de façon significative, de 3000 à 5000 kg/ha pour le riz et 2500 à 4000 kg/ha pour le maïs, dans les parcelles tests; Les contraintes de production sont identifiées et des solutions proposées en temps réel.

#### Résultats à moyen et long terme

Des techniques appropriées et durables d'arrosage pour différentes conditions pédo-climatiques et socio-économiques sont adoptées; La réduction des prélèvements d'eau d'irrigation et accroissement des superficies irrigables; Le renforcement des capacités d'adaptation des populations par la maîtrise et la pratique des cultures irriguées à grande échelle.

### 3. MISE EN OEUVRE

Cette démarche qui vise la couverture de tous les périmètres ne bénéficiant pas actuellement d'activités de ce type va d'abord concerné 3 sites pilotes (Bagré, Sourou, Vallée du Kou).. Les travaux seront réalisés en collaboration avec les organisations de producteurs (coopératives), les structures techniques chargées de la mise en valeur (AMVS, MOB, DRA), la Direction de la Vulgarisation Agricole (DVA), l'Institut de l'Environnement et de Recherches Agricoles (INERA) avec le soutien scientifique des institutions de recherche et de formation .

#### Intrants (ressources financières, ressources humaines, équipements, déplacements)

Pour la mise en oeuvre de ces activités et les besoins financiers, voir le tableau I;

- Les ressources humaines disponibles dans les structures de recherche, les services de vulgarisation et les ONGs seront renforcées par le recrutement d'un ingénieur et d'un technicien par site retenu;
- Réhabilitation du parc météo existant par une station microclimatique automatique;
- La mise en place d'un dispositif lisymétrique pour une mise à jour de l'évaluation des besoins en eau des cultures;
- Un véhicule tout terrain pour assurer la liaison entre les sites du projet et une moto par site pour le suivi des parcelles et des champs.

**Les différentes étapes de la démarche sont les suivantes:**

- Faire un bilan des techniques disponibles pour des conditions climatiques similaires et établir ou actualiser le recueil de fiches techniques de référence en utilisant les résultats disponibles;
- Définir des critères d'évaluation et d'étude d'impact;
- Choisir des sites selon leur représentativité, leur accessibilité et compte tenu des autres composantes complémentaires du projet en cours;
- Etablir une situation de base ou de référence;
- Constitution de l'équipe pluridisciplinaire et répartition des tâches (implication des organisations paysannes et des structures de mise en valeur);
- Constitution des équipes de suivi (facilitateurs, enquêteurs, techniciens), de mise en oeuvre des tests et d'appui aux producteurs sur les périmètres retenus;
- Formation des facilitateurs, enquêteurs, techniciens. Commande, mise à disposition et bon fonctionnement des équipements de collecte de données sur le terrain.

#### **Arrangements institutionnels**

La mise en oeuvre de ce programme suppose l'implication des producteurs et des services d'encadrement de chaque périmètre irrigué. Le volet recherche d'accompagnement et le transfert participatif des technologies sera assuré par l'INERA avec l'appui des structures de vulgarisation et les ONGs en place.

#### **Risques et difficultés**

La mise en oeuvre du projet et l'atteinte des objectifs peuvent être entravées par: l'insuffisance des ressources humaine qualifiées; le faible niveau de participation effective de l'ensemble des acteurs; la lenteur des procédures comptables et administratives; le financement tardif du projet et les catastrophes naturelles.

### **4. SUIVI ET ÉVALUATION**

#### **Suivi des activités**

Le suivi évaluation du projet sera assuré par les structures existantes. Il s'agit: au plan local du CCTP avec la participation des organisations des périmètres irrigués; au plan national la Direction des Etudes et Planification des Ministères techniques impliqués.

#### **Evaluation de la mise en oeuvre et étude d'impact**

Le SP/CONEDD sera chargé d'organiser l'évaluation et le suivi d'impact du programme de renforcement des capacités d'adaptation à la variabilité et changement climatiques.

### **5. RESSOURCES FINANCIÈRES**

**Tableau I: Proposition budgétaire pour la mise en oeuvre dans trois sites (en USD)**

	<b>Année 1</b>	<b>Année 2</b>	<b>Année 3</b>	<b>TOTAL</b>

Equipement	34 000			34 000
Salaire	11 000	11 000	11 000	33 000
Mise en place du dispositif	132 000	80 000		212 000
Formation des producteurs	38 000	44 000	40 800	122 800
Production de documents	200	400	600	1 200
Frais de gestion et imprévus	21 520	13 540	52 40	40 300
<b>TOTAL</b>	<b>236 720</b>	<b>14 8940</b>	<b>57 640</b>	<b>443 300</b>

# BURKINA FASO

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## NAPA PRIORITY PROJECT 8

### SÉCURISATION DE ZONES À VOCATION PASTORALE DANS LES RÉGIONS DU SAHEL ET DE L'EST

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#### 1. JUSTIFICATION

L'un des effets majeurs des changements climatiques sur le secteur de l'élevage est la réduction des zones de pâturage et notamment les espaces stratégiques tels que les bas-fonds, les bourgoutières et les points d'abreuvement. En effet, la variabilité et la baisse de la pluviosité entraînent l'extension des terres cultivées et l'utilisation agricole des bas-fonds. Du fait de la croissance démographique, mais aussi de celui de l'aridification du climat, les agriculteurs ont tendance à compenser la baisse des rendements agricoles par l'augmentation des surfaces cultivées et par l'exploitation accrue des bas-fonds. Ainsi, la progression des superficies emblavées est estimée à plus de 3% par an au détriment des terres de parcours (MRA, 2000). L'accès aux bas-fonds constitue un maillon important de la chaîne de pâturage annuelle, notamment par rapport aux eaux de surface et aux réserves fourragères de saison sèche. La mise en valeur agricole des bas-fonds à travers les cultures de contre-saison et les aménagements hydro-agricoles dans les années 70 et 80 privent l'élevage de ressources-clés. De nos jours, les projets d'irrigation de petite envergure prennent de l'ampleur, comme c'est le cas du Projet Petite Irrigation Villageoises (PPIV) et du Projet de Développement de l'Irrigation Privée et d'Activités Commerciales (PDIPAC). Ces programmes ne prennent pas suffisamment en compte la rupture d'accès et d'immobilisation d'espaces stratégiques pour les éleveurs.

La réduction des zones de pâturage et l'occupation agricole des espaces pastoraux stratégiques engendrent la vulnérabilité des systèmes d'élevage pastoraux. Le bilan fourrager est déficitaire en zones sahélienne et sub-sahélienne, en équilibre instable en zone nord-soudanienne et excédentaire seulement en zone sud-soudanienne (MRA, 2000). Cette réduction de l'espace avec pour corollaire le déficit fourrager, est à l'origine de la transhumance nationale et transfrontalière d'un grand nombre de troupeaux vers les pays côtiers. L'évolution du phénomène est telle que certains éleveurs laissent une partie de leur troupeau dans les pays d'accueil. Au cours des grandes sécheresses des années 1970 et 1980, la crise fourragère a décimé plus de 30% des troupeaux bovins et ruinés les éleveurs dans le Sahel burkinabé. Au regard des difficultés liées à la transhumance (taxes illicites, conflits entre éleveurs et autres usagers des ressources naturelles) et des risques de perte du capital-bétail (transfert de bétail vers les pays d'accueil, mortalités), il est urgent que des dispositions soient prises pour sécuriser et réhabiliter les ressources pastorales restantes. Celles-ci sont d'autant plus urgentes que, au-delà de l'élevage, les mortalités et le transfert du bétail ont des conséquences graves sur tout le secteur agricole, la sécurité alimentaire des ménages, l'équilibre nutritionnel des populations et l'économie nationale.

## 2. DESCRIPTION

### Objectif global

Renforcer les capacités d'adaptation des pasteurs/agropasteurs aux effets néfastes de la variabilité et des changements climatiques.

### Objectifs spécifiques

- Identifier et préserver les zones pastorales et les espaces pastoraux stratégiques;
- Appuyer les pasteurs/agro-pasteurs dans l'aménagement et la gestion rationnelle des zones à vocation pastorale, incluant la récupération des terres de parcours dégradées;
- Apporter un appui à la sédentarisation et à l'intensification de la production animale (sous-troupeau laitier, embouche, etc.).

### Activités

- Informier et sensibiliser les producteurs sur les effets néfastes des changements et de la variabilité climatique;
- Réaliser un diagnostic participatif thématique, avec cartographie des espaces à vocation pastorale à l'échelle du terroir;
- Identifier les espaces pastoraux à préserver leurs limites par le Comité Villageois de Développement (CVD);
- Délimiter de façon participative les zones de parcours à l'échelle du village;
- Elaborer et adopter des outils de reconnaissance officielle des espaces à sécuriser;
- Elaborer et mettre en oeuvre d'outils d'aménagement et de gestion des espaces pastoraux sécurisés (plan de gestion, règles internes de gestion des ressources naturelles, etc.);
- Renforcer les capacités des éleveurs dans divers domaines (organisation coopérative, gestion des pâturages, gestion des troupeaux, etc.).

### Contributions

Assistance technique et financière, équipements et appui institutionnel.

### Résultats à court terme

- Les espaces à vocation pastorale et les espaces pastoraux stratégiques sont protégés contre l'extension des cultures;
- Les terres dégradées dans les zones à vocation pastorale sont restaurées;
- La productivité des pâturages naturels est accrue;
- Les zones à vocation pastorale sont viabilisées par la mise en place d'infrastructures zoo-sanitaires et hydrauliques;
- Les droits fonciers des éleveurs sont reconnus et sécurisés;
- Les capacités des éleveurs en gestion coopérative et en gestion intégrée des pâturages et des troupeaux sont renforcées;
- La mortalité des animaux a diminué.

### Effets à long terme

- Le bilan pastoral (fourrages et eau) est équilibré ou positif et la productivité animale augmentée;

- L'ampleur du phénomène de la transhumance a diminué (effectifs réduits et durée de la période de transhumance raccourcie);
- Les conflits entre les éleveurs et les autres usagers des ressources naturelles ont régressé (nombre et violence);
- La disponibilité en produits animaux est accrue;
- La traction animale et la fertilisation des terres agricoles sont améliorées;
- L'état nutritionnel des populations est amélioré;
- La contribution de l'élevage à l'économie nationale (revenus des éleveurs et recettes d'exportation) a augmenté.

### 3. MISE EN OEUVRE

#### Arrangements institutionnels

Le projet sera mis en oeuvre par le Ministère des Ressources Animales, notamment par la Direction Générale des Espaces et des Aménagements Pastoraux (DGEAP). Un partenariat sera établi avec d'autres ministères concernés par la sécurisation foncière en milieu rural (Ministère de l'Agriculture, de l'Hydraulique et des Ressources Halieutiques, Ministère de l'Environnement et du Cadre de Vie, Ministère de l'Administration Territoriale et de la Décentralisation, etc.), les collectivités territoriales et les organisations d'éleveurs.

#### Risques et obstacles

Le principal obstacle est relatif aux vellétés de revendication des zones pastorales sécurisées par les propriétaires terriens ou leurs ayants droit.

### 4. SUIVI ET ÉVALUATION

Le suivi du projet sera assuré semestriellement par un Comité de pilotage présidé par le SP/CONEDD et regroupant les représentants des acteurs concernés. Une réunion annuelle de bilan et de programmation des activités sera également organisée. Une évaluation externe sera réalisée à mi-parcours et en fin de projet.

### 5. RESSOURCES FINANCIÈRES

*Le coût du projet est estimé à USD 320 000*

#### Budget détaillé

Activités	Année 1	Année 2	Année 3	TOTAL
<b>A. Sécurisation des zones à vocation pastorale</b>				
Activités de diagnostics participatifs dans les différents sites du projet	18 000			18 000
Cartographie du terroir et des espaces pastoraux à sécuriser	6 000			6 000
Appui aux cadres de concertation pour la négociation des espaces à sécuriser	12 000			12 000
Opérations de délimitation et de validation des limites des espaces à sécuriser	6 000			6 000

Elaboration et adoption d'outils de reconnaissance officielle des espaces sécurisés		8 000		8 000
Sous-total	42 000	8 000	0	50 000
<b>B. Aménagement et gestion des espaces sécurisés</b>				
Elaboration d'outils de gestion (plan d'aménagement, cahier de charge, etc.)		30 000		30 000
Aménagement des pâturages (délimitation, ouverture de pistes pare-feux, etc.)		70 000		70 000
Mise en place d'infrastructures zoo-sanitaires et hydrauliques		90 000		90 000
Sous-total	0	190 000	0	190 000
<b>C. Renforcement des capacités</b>				
Renforcement des capacités des éleveurs (gestion coopérative, gestion holistique des pâturages, gestion des troupeaux)	5 000	10 000	10 000	25 000
Appui institutionnel (véhicule, équipement informatique, fonctionnement, formation des techniciens)	35 000	10 000	10 000	55 000
Sous-total	40 000	20 000	20 000	80 000
<b>Total (A+B+C)</b>	<b>82 000</b>	<b>218 000</b>	<b>20 000</b>	<b>300 000</b>



# BURKINA FASO

## NAPA PRIORITY PROJECT 9

### SÉCURISATION DE LA PRODUCTION AGRICOLE PAR L'UTILISATION DE PAQUETS TECHNOLOGIQUES APPROPRIÉS DANS LES RÉGIONS DU SUD-OUEST ET DE L'EST.

#### 1. JUSTIFICATION

La pression démographique, la variabilité et le changement climatique, rendent les productions agricoles et pastorales très aléatoires si bien que 31% de la population dans les régions du Sud-Ouest et de l'Est se situe en-dessous du seuil de pauvreté. Au fil des ans, des techniques de lutte anti-aléatoire (variétés, date de semis, travail du sol, techniques CES) et d'amélioration de la fertilité des sols (fosses fumières, compostages, phosphates naturels, doses de fumures minérales économiques) ont été mis au point dont certaines ont fait leur preuve. Le principal défi est la gestion rationnelle de l'eau de pluie et la disponibilité en bonnes terres agricoles pour un développement durable. La question fondamentale est de savoir « comment renforcer l'adaptation des populations en forte croissance démographique dans un contexte de pluviométrie non fiable par la pratique d'une agriculture et une organisation des producteurs qui offrent le maximum de sécurité alimentaire » ?. C'est dans ce contexte que la maîtrise des techniques de production revêt une importance particulière pour réaliser la satisfaction des besoins alimentaires des populations sahéliennes.

De nombreux projets ont été mis en oeuvre ou sont en cours en vue de renforcer les capacités d'adaptation des populations à travers notamment la gestion durable de leurs terres. L'environnement technique est donc favorable à l'adoption des paquets technologiques, surtout renforcer les acquis et soutenir les projets en cours dans les provinces du Zondoma et du Nammetenga.

#### 2. DESCRIPTION

##### **Objectif global**

Le renforcement des capacités d'adaptation et le bien-être des populations par la récupération des terres dégradées et une agriculture durable, productive, diversifiée, et rentable.

##### **Objectifs spécifiques**

- Récupérer les terres dégradées;
- Accroître la production par une amélioration des rendements des productions;
- Sécuriser les productions de sorgho en réduisant les variations interannuelles des rendements;
- Réduire l'effet des déficits pluviométriques;
- Améliorer les caractéristiques chimiques et hydrodynamiques des sols;
- Réduire l'insécurité alimentaire;
- Renforcer des capacités techniques des producteurs et productrices;
- Renforcer les capacités d'organisation des producteurs;
- Renforcer les capacités d'utilisation de l'information climatique par les producteurs.

##### **Activités**

- Rechercher et collecter la documentation puis contacter les personnes ressources;
- Organiser des ateliers d'information et de sensibilisation sur les objectifs du projet et l'implication des acteurs locaux et des bénéficiaires;
- Sensibiliser les acteurs sur les changements climatiques et la dégradation des ressources;

Mettre en place et évaluer les paquets technologiques et des stratégies d'ajustement par entretiens, champs écoles (CES, DRS et autres);  
 Mener des enquêtes sociologiques, économiques et agronomiques auprès des producteurs;  
 Actualiser la période favorable aux semis;  
 Transférer les connaissances par la formation et les visites commentées, encadrement de stagiaires.

### **Résultats immédiats**

La création d'une base de données est effective;  
 Les prévisions saisonnières et l'information pluviométrique sont efficacement utilisées;  
 Les nouvelles techniques sont évaluées en grandeur réelle;  
 Les productions sont sécurisées;  
 Les rendements sont accrus;  
 Les capacités techniques et organisationnelles avec la prise en compte du genre;  
 La reconstitution et le maintien de la fertilité des sols, sont renforcés;  
 Les producteurs sont sensibilisés et leur capacité renforcée sur la bonne gestion de la fertilité des sols et l'utilisation des semences améliorées;  
 Les rendements ont augmenté de façon significative dans les parcelles tests;  
 Les contraintes de production sont identifiées et des solutions proposées en temps réel.

### **Résultats à moyen et long terme**

Des techniques de CES/DRS appropriées pour différentes conditions pédo-climatiques et socio-économiques sont adoptées;  
 Le renforcement des capacités d'adaptation par l'intensification des cultures pluviales.

### **3. MISE EN OEUVRE**

Parmi les actions de renforcement des capacités, les techniques CES/DRS sont les plus répandues, cependant les besoins restent énormes avec des possibilités d'amélioration. Deux sites viendront renforcer ceux en cours.

Ces travaux seront réalisés en coopération (collaboration) avec les organisations de producteurs, les structures techniques chargées de la vulgarisation des technologies, l'Institut de l'Environnement et de Recherches Agricoles (INERA).

#### **Intrants (ressources financières, ressources humaines, équipements, déplacements)**

Pour la mise en oeuvre des activités, voir le tableau I pour le besoin financier;  
 Les ressources humaines disponibles dans les structures de recherche, les services de vulgarisation et les ONGs seront utilisées pour la mise en oeuvre des activités;  
 Pour une meilleure connaissance des conditions climatiques, il faut renforcer le dispositif de collecte de données climatiques.

#### **Arrangements institutionnels**

La mise en oeuvre de ce programme suppose l'implication des producteurs et des services d'encadrement de chaque périmètre irrigué. Le volet recherche d'accompagnement et le transfert participatif des technologies sera assuré par l'INERA avec l'appui des structures de vulgarisation et les ONGs qui oeuvrent dans le domaine.

### Risques et difficultés

La mise en oeuvre du projet et l'atteinte des objectifs peuvent être entravées par: l'insuffisance des ressources humaine qualifiées; le faible niveau de participation effective de l'ensemble des acteurs; la lenteur des procédures comptables et administratives; le financement tardif du projet et les catastrophes naturelles.

#### 4. SUIVI ET ÉVALUATION

##### Suivi des activités

Le suivi sera assuré par un comité de pilotage dirigé par le SP/COEDD avec l'implication des services en charge de l'agriculture et de l'environnement. Les cadres de concertations locales comme le CCTP et les organisations des producteurs, seront mises à contribution pour faire le point des résultats aux acteurs.

##### Evaluation de la mise en oeuvre et étude d'impact

Ce volet sera organisé par le Secrétariat Permanent du CONEDD qui va dresser une liste d'experts chargés de faire l'évaluation en liaison avec les Partenaires Techniques et Financiers. Un système de suivi d'impact du programme de renforcement des capacités d'adaptation à la variabilité et changement climatique sera mis en place et coordonné par le Secrétariat Permanent du CONEDD.

#### 5. RESSOURCES FINANCIÈRES

**Tableau I: Proposition budgétaire pour la mise en oeuvre dans deux sites (en USD)**

	<b>Année 1</b>	<b>Année 2</b>	<b>Année 3</b>	<b>TOTAL</b>
Mise en place des champs écoles	80 000			80 000
Personnel	8 000	8 000	8 000	24 000
Formations renforcement des capacités	46 000	64 000	50 000	160 000
Production de documents	200	300	400	900
Frais de gestion et imprévus	13 420	10 844	8 760	33 024
<b>TOTAL</b>	<b>147 620</b>	<b>83 144</b>	<b>67 160</b>	<b>297 924</b>

# BURUNDI

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## NAPA PRIORITY PROJECT NO. 7

### POPULARISATION OF SHORT CYCLE AND/OR DROUGHT RESISTANT FOOD CROPS

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Translated from original French version

#### RATIONALE

More than 90% of the economy of Burundi is based on traditional self-subsistence agriculture. The majority of the population draws their income from the sale of agricultural produce, which represents approximately 50% of the GDP and provides more than 90% of employment in the rural sector. The population's food supply is thus based on food production of local origin.

For a few years now, the rains have been starting later, beyond October, and ending early before the end of April. On top of this, intermittent and overdrawn periods of rains during the growth and the development of seedlings are occurring. Combined with the weak fertility of soils, the result is the fall of productions and the uncertainty of food security in the country. Ultimately, consequences are absolutely critical and causing repetitive situations of emergency food aid in many areas.

With the aim of rectifying this worrying situation of rain scarcity and disturbance of the ecological agro-systems, it is urgent to develop and disseminate varieties of food crops resistant to drought and adapted to the weak soil fertility while popularising the corresponding plant packages. These include sweet potato, sorghum and corn. The support would be firstly directed towards the northern regions and other most affected regions.

#### DESCRIPTION

##### **Global objective**

The global objective is to increase the agricultural production in order to contribute to improved food security by the development and the popularisation of the varieties of drought-resistant food crops in all the provinces of the country affected by climate change.

##### **Specific objectives**

- Development and dissemination of drought-resistant varieties;
- Development and dissemination of varieties resisting to soil acidity;
- Development and popularisation of appropriate technological packages;
- Training of farmers/associations on seed production techniques;
- Production and availing of grains in seedling centres.

##### **Activities**

##### *Dissemination of drought-resistant varieties*

The project will support research programmes to disseminate the short cycle varieties that resist to drought periods. The actions will be limited to the last confirmative stage of the varieties in the regions of their adaptation.

*Dissemination of varieties resistant to soil acidity*

Development of varieties adapted to tolerate soil acidity and periods of rainfall deficit.

Development and popularisation of appropriate technological packages

The farming techniques will be updated for each crop and availed to the farmers. They will be popularised in the form of the phytotechnic forms with supporting illustrations.

*Training of farmers/associations of seed producers*

Preferably, the training will be given to pilot units of demonstration of these farming techniques that will be identified by the communal supervisors. Monitoring will be ensured at each hill of census by an agricultural extension worker. Preliminary trainings (1 per province) of the extension workers will be provided by the specialised and multidisciplinary trainers.

*Production and availing of seeds of the adapted varieties*

Pre-base seeds of varieties tolerant to drought and to weak fertility of soils will be produced in the ISABU seedling centres. They will be made available in public seedling centres and some groupings qualified in the production of basic and commercial seeds in the target provinces. They will be primarily distributed to the most vulnerable families.

**Outputs****Short term outputs**

Diversification of varieties performing in weak rainfall and poor soil fertility;  
Adoption and control of farming techniques by farmers;  
Increased agricultural production and reduced famine;  
Improved human health;  
Increase in population's income as a result of sales and use of the productive surplus in the potential over-harvesting regions.

**Long term outputs**

Increase the production of food crops  
Regular provisioning of the surplus in the regions of strong consumption  
Ensured food self-sufficiency  
Promotion of the production directed towards the economy of the market.

**IMPLEMENTATION****Institutional arrangements**

The project will be implemented under the Ministry for Agriculture and Livestock. It will be carried out by ISABU as regards the development of performing varieties and the production of pre-base seeds. ISABU will work in collaboration with the Ministry for Land Management, Tourism and Environment, the Department of Seeds and Plants Promotion (DPSP) and the DPAEs as regards the production of basic seeds and the groupings of the producers of commercial seeds under DPAEs supervision.

**Risks and barriers**

Most of the crops subjected to extension are not part of the populations' current food habits;

Irregularity of budget releasing according to instalments corresponding to the farming timing.

#### Monitoring and evaluation

The National Steering Committee will be composed of representatives from ISABU, the MINAGRIE office, the Directorate-General for Forests, Tourism and Environment, DPSP, DPAEs and a representative of farmers by target province.

#### Duration

3 years

#### COST

*USD 294,000*

<b>Activities</b>	<b>Cost (USD)</b>
Production of seeds of the varieties adapted to climate change	250,000
Dissemination of varieties resisting drought	5,000
Dissemination of varieties tolerant to soil acidity	5,000
Development and popularisation of appropriate phytotechnic forms	4,000
Training of technicians and the groupings producing seeds	30,000
<b>Total</b>	<b>294,000</b>

# BURUNDI

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## NAPA PRIORITY PROJECT NO. 8 ZERO-GRAZING CATTLE BREEDING

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Translated from original French version

### RATIONALE

The cattle-breeding sector will be affected by climate change. Extreme climate phenomena (cases of prolonged drought, floods) will modify the limits of pastoral vegetation, the quality and quantity of fodder, the duration of the season of vegetable growth, animal productivity and the quality of water.

In cases of prolonged drought, pastures are not renewed and become rare. This decreases the dairy and meat output and makes the domestic animals skeletal. Stockbreeders then migrate to more favourable regions, although this leads to risks of all sorts of diseases that can be met due to promiscuity.

Burundi agricultural development and particularly the economic advancement of several farms will pass by systems of production that mainstream agriculture, cattle-breeding and forestry activities so as to protect and improve the edaphic capital and diversify incomes.

### DESCRIPTION

#### **Global objective**

The global objective is to improve and increase the agro-sylvo-pastoral production and to protect the environment.

#### **Specific objectives**

- Popularisation of zero-grazing breeding techniques;
- Promotion of the breeding of species adapted to the local climate conditions.

#### **Activities**

- Train the population on agro-sylvo-pastoral mainstreaming methods;
- Support the population in the construction of cattle sheds, installation of fodder fields, plantation of trees, shrubs and graminaceous fodder.
- Identify and import breeding species (bovines, goats and the porcine of performing breed) adapted to local climate conditions;
- Distribute animals to the pilot households (1 000 households).

#### **Outputs**

##### **Short term outputs**

- Increase in the fertility and the productivity of arable lands;
- Increase in the dairy production;
- Conservation of waters and soils;
- Increase in the income of the population;
- Reduced bush fires.

##### **Long term outputs**

- Forest regeneration

**IMPLEMENTATION****Institutional arrangements:**

Localisation: nationwide

Stakeholder: Ministry for Agriculture and Livestock

**Risks and barriers:**

Absence of effective commitment by the political decision makers and the government as regards NAPA prioritisation;

Non-allocation of adequate budget;

Insecurity;

Inadequate extension services.

**Monitoring and evaluation:**

Install a Steering Committee, a Project Coordinator and M&amp;E Officer.

**COST***USD 300,000*

<b>Activities</b>	<b>Cost (USD)</b>
Train the population on agro-sylvo-pastoral mainstreaming methods	80 000
Support the population in the construction of cattle sheds, installation of fodder fields, plantation of trees, shrubs and graminaceous fodder	100 000
Identify and import breeding species (bovine, goats and porcine of performing breed) adapted to local climate conditions and distribute them to pilot households (500 households)	120 000
<b>Total</b>	<b>300 000</b>



# CAMBODIA

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## NAPA HIGH PRIORITY PROJECT 3E (NON-HEALTH) DEVELOPMENT AND IMPROVEMENT OF SMALL-SCALE AQUACULTURE PONDS

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### SECTOR

Agriculture and Water Resources

### RATIONALE

Fish stocks have declined in recent years due to overfishing, destructive fishing practises, pollution, reduced water availability and destruction of fish habitat. Development of water resources, particularly dam construction has resulted in changes in water flows and levels, which in turn hinders fish migration in some areas. Water availability is expected to fluctuate under different climate conditions, which will have further negative impacts on fish stocks. Small-scale aquaculture contributes to food security in areas where wild fish is no longer available and in seasons when wild fish is in short supply.

### DESCRIPTION

#### Objectives

- To ensure food security in the areas where wild fish stocks are insufficient to meet demand;
- To increase the income of people living in these areas.

#### Activities

- Construct new ponds and dredge existing ones in selected districts;
- Provide fish fry;
- Introduce sustainable aquaculture technologies.

#### Short-term outputs

- 500 small-scale aquaculture ponds developed;
- Fish production increased;
- Sustainable aquaculture technologies introduced.

#### Potential long-term outcomes

- Rural livelihoods improved;
- Food security improved;
- Poverty reduced.

#### Location

The project will be implemented in the following provinces: Kampong Cham (Chmakar Leu and Tboung Khmum Districts), Kampong Speu, Kandal (Angk Snuol and Kandal Stueng Districts), Kratie (Sambo, Kracheh and Chhloung Districts), Svay Rieng, and Sihanoukville Municipality (Stueng Hav District).

#### Time frame

3 years.

### IMPLEMENTATION

#### **Institutional arrangement**

MAFF will implement the project in collaboration with local authorities and NGOs.

#### **Risks and barriers**

Potential land use conflict, weak social capital in local communities, soil characteristics, water availability, and water pollution.

#### **Evaluation and monitoring**

The following indicators will be used: number of ponds constructed, number of fish species successfully raised, and fish production.

### RELATED DEVELOPMENTS

MAFF has provided support to aquaculture with a focus on commercial exploitations, but small-scale aquaculture in ponds has only been introduced on a limited basis. MAFF has provided extension service and training to farmers about fishpond cultures, as well as ricefish culture in Kandal, Prey Veng, Svay Rieng and Takeo Provinces.

### COST

*USD 4,000,000.*

# CAMBODIA

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## NAPA HIGH PRIORITY PROJECT 3F (NON-HEALTH) PROMOTION OF HOUSEHOLD INTEGRATED FARMING

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### SECTOR

Agriculture and Water Resources

### RATIONALE

Most Cambodian farmers depend on subsistence rainfed rice farming, which is vulnerable to climate hazards such as flood and drought. Official records indicate that the frequency and severity of flood and drought have increased in Cambodia in recent years. This has resulted in increased crop losses, which in turn leads to food shortages and poor health. As a result, affected people migrate en masse to seek jobs and higher incomes in cities and in the neighbouring countries. Some of them go to forest to log or to collect non-timber forest products to meet their needs. The promotion of household integrated farming, which includes multi-cropping, livestock raising and aquaculture, will assist farmers in generating higher incomes, and improve food security and rural livelihoods.

### DESCRIPTION

#### Objectives

- To increase agricultural productivity;
- To improve farmers' incomes, food security and livelihoods in the areas affected by flood and drought.

#### Activities

- Identify areas suitable for the project;
- Select households for pilot project implementation;
- Train selected farmers on sustainable farming, livestock, and aquaculture technologies;
- Implement pilot project in selected areas;
- Disseminate experience and technologies to other areas.

#### Short-term outputs

- 300 households trained in the pilot phase;
- Agricultural productivity improved;
- Sustainable integrated farming introduced and successfully implemented.

#### Potential long-term outcomes

- Food security improved;
- Rural livelihoods improved;
- Sustainable integrated farming expanded to other areas;
- Poverty reduced.

#### Location

The pilot project will be implemented in six provinces: Banteay Meanchey, Battambang, Kampong Speu, Prey Veng, Svay Rieng, and Takeo.

**Time frame**

3 years.

**IMPLEMENTATION****Institutional arrangement**

MAFF will coordinate the project and MAFF Provincial Departments will implement it in collaboration with local authorities and concerned NGOs.

**Risks and barriers**

Potential land use conflicts and land availability, weak social capital in local communities, water availability.

**Evaluation and monitoring**

The following indicators will be used: number of households trained, number of farming systems successfully implemented, household income, agricultural production.

**RELATED DEVELOPMENTS**

MAFF with support from ADB has implemented similar projects in selected areas of Banteay Meanchey, Battambang, Pursat and Siem Reap. A number of NGOs have implemented integrated farming projects in Prey Veng and Svay Rieng Provinces.

**COST**

*USD 2,500,000.*

# CAMBODIA

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**NAPA HIGH PRIORITY PROJECT 4C (NON-HEALTH)  
COMMUNITY BASED AGRICULTURAL SOIL CONSERVATION IN SRAE  
AMBEL DISTRICT, KOH KONG PROVINCE**

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## SECTOR

Agriculture and Water Resources

## RATIONALE

Loss of forest cover and inappropriate land use has accelerated erosion in the coastal watershed. This has led to increased sedimentation in coastal waters and has affected coral reefs, seagrass beds, and fisheries productivity.

## DESCRIPTION

### Objectives

To reduce soil erosion from agricultural land in the coastal watershed;  
To increase food security.

### Activities

Train farmers in soil conservation techniques, including appropriate cropping systems;  
Identify with local communities farming practises that reduce soil erosion;  
Implement with local communities farming practises that reduce soil erosion.

### Short-term outputs

Soil conservation practises implemented in 50 farms;  
100 farmers trained in soil conservation techniques;  
Farm productivity increased.

### Potential long-term outcomes

Soil erosion reduced;  
Sediment load in coastal waters reduced;  
Soil conservation practises transferred to other farmers in the area.

### Location

The project will be implemented in Koh Kong Province (Srae Ambel and Botum Sakor Districts).

### Time frame

3 years.

## IMPLEMENTATION

### Institutional arrangement

MAFF will coordinate the project and MAFF's Provincial Department in Koh Kong will implement it in collaboration with local authorities and NGOs.

### Risks and barriers

Lack of participation and interest from farmers.

**Evaluation and monitoring**

The following indicators will be used: number of farmers trained and number of participating farms.

**RELATED DEVELOPMENTS**

AFSC has worked with local communities in Srae Ambel in the following areas: sustainable agriculture, and community forestry and fisheries.

**COST**

*USD 2,000,000*

# CAPE VERDE

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## NAPA PRIORITY PROJECT 2 MODERNIZATION AND DIVERSIFICATION OF AGRICULTURAL PRODUCTION FOR FOOD SECURITY IMPROVEMENT

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### JUSTIFICATION

Similarly to the Water Resources, the agricultural sector is characterized by a great vulnerability due to scarcity of natural resources (water and soil) and to the climatic conditions.

Extreme events, such as landslides and floods, signal the culminating points of vulnerability and climate change with great socio-economic impacts. The frequency of these events seems higher at the global level.

The frequent torrential rains in Cape Verde provoke enormous losses of infrastructure, agricultural production, means of subsistence, large amounts of water into the sea and, at times, displaced families, or even loss of human lives.

Despite this vulnerability, agriculture, like other sectors in the agrarian area, is important for the country, allowing for subsistence of a large number of families, whose family life organization is highly associated to the land, although they are not able to achieve alimentary self-sufficiency.

According to RGA 2004 data, the total agricultural population was 222,254 people, making up for 47.35% of the population projected for 2004, which is an indication of the socio-economic weight of this sector, despite the vulnerability and fragility of the productive tissue. This importance is particularly accentuated for women since the female agricultural population varies between 45.9%, in the Paul region of the island of Santo Antão and 56.1%, in the Tarrafal region, island of Santiago.

As a sub-Saharan country, Cape Verde suffered very intensely the catastrophic effects of droughts<sup>1</sup>. This climatic particularity characterized by the extreme insufficiency and irregularity of precipitations, both temporally and spatially, associated to the scarcity of agricultural lands and its strong degradation through soil erosion, is the root cause of vulnerability and fragility of the agricultural sector.

Rain fed agriculture that represents the greater potential of agricultural production of the country is practiced in very steep hillsides of the humid and sub-humid regions of the watersheds, where water erosion is very important and human pressure becomes greater and greater. This phenomenon leads to an annual loss of arable land of considerable proportions and, as a consequence, to the increase of crop practice in marginal soils, using the association of maize and beans, a technique that further aggravates the soil erosion process.

Despite the important efforts already undertaken in the area of water and soils conservation, the necessity of protection against erosion, in particular water erosion, continues to be an imperative all over the humid and sub humid bioclimatic strata. On the other hand, particularly for the lower lying communities, the maintenance and

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<sup>1</sup> In the past 265 years, there were 97 years of drought, that is, one year of drought on the average in each 3 years. From the droughts that were registered, 14 had a duration of 3 years or more (2002-2005 National Sustainable Food Security Strategy, cited in the 2004-2007 DECRP, pag. 22).

improvement of the hydrologic balance becomes essential, mainly in what concerns reduction of surface draining.

Similarly, the establishment of integrated protection systems that allow for a rational and sustainable exploration of water, soil and vegetation resources on the part of local farmers/raisers, has a capital importance role in reduction of vulnerability and the negative effects of climate change, having in account its contribution for the recharge of aquifers, soil protection, increase of firewood production and fodder, use of marginal lands for rain fed crops through adoption of agro-forestry systems and increase of agricultural productivity.

On the other hand, besides the contribution for protection and restoration of the environment that is in a current process of accelerated degradation, the project will also contribute to improve the conditions of life of several poor rural families who depend almost exclusively on land productivity for their subsistence. It will also allow, at the medium term, to place a large potential of labor in the field and, in the long term, to generate some self-employment in the silvo-pastoral domain.

Thus, the relevance of implementation of this project is to gradually make agricultural activity less vulnerable to the negative impacts of climate change, improving simultaneously the level of income of the families and the perspective of alimentary security, in particular that of the most vulnerable families in the rural world, where the rates of poverty and extreme poverty are higher, mainly because their survival strategies depend to a great extent on agricultural activity.

#### DESCRIPTION

##### **Specific Objective**

To adapt the agro-silvo-pastoral production systems to the climate change and variability, aiming at reducing food insecurity.

##### **Duration**

The estimated duration of the Project is five (5) years.

#### COMPONENTS, RESULTS AND ACTIVITIES

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**COMPONENT 1: Reinforcement of stakeholder's capacities in matters of adaptation to the climate and variability changes under the systemic, organizational and individual point of view**

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##### **Result 1a**

*The stakeholders are better organized and trained in sustainable production techniques*

##### **Activities**

Training of stakeholders in sustainable production techniques (integrated production and protection, hydroponics, greenhouse production, among others);

Technical, material and organizational support to the institutions and community base organizations, for the integrated and participatory management of watersheds;

Rehabilitation and transformation of rainfall stations into climatological or agro-meteorological stations, in the zones more exposed to the climatic risks;



Reclassification of the agro-ecological zones;

**Result 1b**

*The policies and the planning instruments of the agro-silvo-pastoral sector take into account the vulnerability and the impacts associated to the climate changes.*

**Activities**

Revision of the policies and planning instruments of the agro-silvo-pastoral sector in order to take into account the vulnerability and impacts of climate change;  
Integration, socialization and validation of the results of activity 1.

**COMPONENT 2: Investment, conservation and field protection activities**

**Result 2**

*The production and productivity capacity of the agro-silvo-pastoral systems is increased and the vulnerable production bases (watersheds, forests, etc.) are protected.*

**Activities**

Intensification and diversification of production of vegetable and fruits crops through the introduction of more adapted crops;  
Support to the practice of vegetable and fruit crop production in pluvial zones, using drip irrigation;  
Construction of torrential correction levees, small walls for correction of ravines in the hillsides, terraces, and other mechanical WSC structures;  
Creation of a rotating fund (micro-credit) for financing income generating activities based essentially on the valuation and the rational management of natural resources;  
Promotion of the use of plant species (*Agave sisalana*), «Barnelo» (*Grewia villosa*), bamboo (*Bambusa vulgaris*) and caniço (*Arundo donax*) against soil erosion (formation of shrub sebes) and utilization of those species for valorization of national handicrafts.

**COMPONENT 3: Research/action on the varieties adapted to the current climate conditions**

**Result 3**

*New agro-silvo-pastoral techniques are experimented and innovative adaptation mechanisms are implemented.*

**Activities**

Experimentation of varieties that are best adapted to the climatic conditions;  
Promotion of knowledge and traditional practices of adaptation of agro-silvo-pastoral production systems to climate change;  
To perfect a methodology for elaboration of the crop calendar, as a function of weather forecasts.

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**COMPONENT 4: Mobilization, Information, Sensitization of the stakeholders on the risks associated to climate change and variability**

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**Result 4**

*Awareness of stakeholders and the adoption of positive attitudes towards the aggravating factors (forest fires, slopes, deforestation, etc.) of the vulnerability to the climate changes and variability.*

**Activities**

Collection of extreme meteorological and climatological data and its diffusion to the stakeholders and the rural communities, in order to guarantee the security of the production systems;

Campaign of sensitization of stakeholders on the negative impacts of the climate change and the climatic variability on natural resources and human activities;

Promotion of improved and adapted cultural techniques to the climate change;

Vulgarization of technological packages on adapted varieties.

**PROJECT COST ESTIMATES**

<b>COMPONENTS</b>	<b>%</b>	<b>COST ESTIMATES (USD)</b>
1. Reinforcement of stakeholder's capacities in matters of adaptation to the climate and variability changes under the systemic, organizational and individual point of view	15%	225 000
2. Investment, conservation and field protection activities	45%	675 000
3. Research/action to improve resistance of the ecosystems	20%	300 000
4. IEC of stakeholders and rural communities	10%	150 000
5. Project management costs	10%	150 000
<b>TOTAL</b>	<b>100%</b>	<b>1 500 000</b>

**Potential donors identified**

Government of Cape Verde;

Global Environment Facility (GEF) - (OP-15 Sustainable Management Terra);

United Nations System in Cape Verde;

European Union;

African Development Bank (ADB);

International Fund for Agricultural Development (FIDA);

Global Mechanism CCD.

# CENTRAL AFRICAN REPUBLIC

## NAPA PRIORITY PROJECT 5

### DÉVELOPPEMENT DE LA CULTURE DES VARIÉTÉS RÉSISTANTES AUX CHANGMENTS CLIMATIQUES DANS LES RÉGIONS CENTRE, NORD ET SUD-EST DE LA RÉPUBLIQUE CENTRAFRICAINE

**Localisation:** République Centrafricaine (régions Centre, Nord et Sud - Est) / Zones Agro-climatiques de la RCA

**Secteur:** Agriculture / Sécurité Alimentaire

**Type:** Prévention / Adaptation aux CC

**Référence:** Ministère en charge de l'environnement /Comité National de Pilotage de la Convention sur les Changements Climatiques

#### JUSTIFICATION

Depuis le milieu des années 60, on constate une dégradation des ressources pluviométriques en République Centrafricaine. Cette diminution pluviométrique en terme de volume s'est traduite par une modification conséquente de la saison des pluies avec un début inégal, même pour des régions situés à latitude égale. Cette variabilité de la date de début de saison, liée à l'installation erratique des pluies provoque un étalement de semis après chaque pluie. En milieu paysan, les dates de semis ne sont pas les mêmes d'une année à l'autre. L'étalement de semis est ainsi une contrainte majeure dans le système de culture, puisqu'il entraîne un décalage du calendrier des activités agricoles.

La conséquence immédiate est la désorganisation du calendrier agricole rendant plus pénible l'ajustement du cycle des cultures au cycle des pluies. Le bouleversement est si important que les producteurs, les éleveurs, les forestiers se heurtent de plus en plus à des problèmes sérieux. La pluviométrie moyenne avant les deux dernières décennies était de 1600mm /an, alors qu'au cours de ces deux dernières décennies, cette moyenne pluviométrique est de 1100mm/an, ce qui est insuffisant pour la croissance et le développement de certaines spéculations comme le café, le cacao, le coton, le tabac et certaines cultures vivrières. La désertification est de plus en plus prononcée, ce qui cause beaucoup de problèmes aux producteurs dans les opérations de semis, d'entretien des cultures, d'aménagement des pâturages ainsi que le domaine forestier et environnemental. L'étude des spéculations nouvelles et leur comportement naturel constituent un atout pour la mise en place de ces spéculations en vue de réduire les méfaits climatiques et leurs conséquences sur le secteur agro-sylvo-pastoral. En République Centrafricaine, il y a cinq (5) mois de saison de pluie pour sept (7) mois de saison sèche. De Janvier à Juin:

en Février: on observe trois (3) à quatre (4) jours de pluie;

en Avril: on relève six (6) jours de pluie;

en Mai: il y a sept (7) jours de pluie. Les mois pluvieux sont Juillet, Août.

La persistance de cette crise amène les paysans à modifier leurs façons culturales en adoptant des stratégies de gestion des risques et des contraintes climatiques. Les populations rurales ont adopté des stratégies d'adaptation; on a vu exemple, comment les paysans, selon les années, peuvent privilégier le coton ou bien le vivrier en tête d'assolement pour faire face au retard de premières pluies. Le souci majeur est d'assurer prioritairement l'autosuffisance alimentaire.

## DESCRIPTION

### **Objectif General**

L'objectif général de cette proposition est de contribuer à la sécurité alimentaire.

### **Objectifs scientifiques et techniques spécifiques**

La communauté scientifique internationale conjugue ses efforts en matière de recherche et de formation agricole pour arrêter la baisse de la production agricole liée à la sécheresse qui sévit en Afrique depuis plusieurs années. L'une des voies fédératrices retenue par les pays africains situés au sud du Sahara (zone sahélienne) consiste à améliorer l'adaptation aux changements climatiques des espèces vivrières et à sélectionner des variétés mieux adaptées, afin d'accroître la productivité agricole.

Ce projet se fixe comme objectifs la compréhension des mécanismes climatiques par l'étude d'interaction sécheresse/plante afin d'améliorer la production agricole en République Centrafricaine.

Les objectifs spécifiques à atteindre sont les suivants:

- lutter contre la pauvreté;
- renforcer la sécurité alimentaire;
- installer ou renforcer les stations de mesures des paramètres climatiques dans les zones agro climatique afin de constituer une banque de données climatiques fiables;
- étude fréquentielle des pluies et détermination pratique des périodes humides favorables au développement des cultures;
- proposer aux institutions de recherches et de vulgarisation des informations fiables sur le climat de la zone et de ses environs. Ce qui contribuera aux prises de décisions agricoles;
- approfondir les connaissances sur les mécanismes agro physiologiques d'adaptation des plantes cultivées à l'interaction plantes/ état hydrique des sols afin de consolider leur intégration dans les programmes de sélection et de création variétale dans les zones soumises aux aléas climatiques permanents;
- mettre en place un Système d'Information Géographique (SIG) ou un Observatoire National de la Production Agricole (ONPA). Le SIG permettra la modélisation du développement des cultures dans un dispositif géographique d'estimation de la production d'analyse géostatistique et de diffusion de l'information.

### **Methodologie**

La méthodologie consistera d'abord à installer ou renforcer le dispositif de mesures des paramètres météorologiques dans la zone d'étude, ensuite, par des études fréquentielles des chroniques pluviométriques, parvenir à caractériser la saison des pluies, les séquences anormalement sèches ou anormalement humides pouvant influencer les productions agricoles.

Parallèlement, les connaissances acquises seront intégrées dans des outils mis au point pour veiller à la protection et à la sécurité de la production.

La démarche mise en oeuvre dans cette étude repose sur l'intégration de ces connaissances dans une approche pluridisciplinaire, afin d'optimiser et de rendre plus performants des programmes de recherches agronomiques de sélection et de création du matériel végétal nouveau, de protéger et de sécuriser la production pour le développement agricole de la République Centrafricaine.

Pour cela, on envisage la mise en place d'un cadre national regroupant les différents partenaires en vue de la poursuite des actions de recherches et de formation concertées et coordonnées. Ces actions associeront l'Université de Bangui à travers le Département de Géographie et L'Institut Supérieur de Développement Rural (ISDR), l'équipe de chercheurs du PRASAC et la direction nationale de la météorologie. A partir des connaissances acquises sur le fonctionnement du climat et le comportement agro physiologique des espèces cultivées face aux contraintes hydriques, les partenaires se proposent de réaliser les études d'interactions sécheresses/plante afin de mieux comprendre les mécanismes de production mais surtout d'adaptation des cultures aux changements climatiques.

#### **Résultats attendus**

Les résultats permettront de stabiliser voire, d'améliorer de façon durable la productivité des cultures vivrières afin d'assurer l'autosuffisance alimentaire. Grâce à des mécanismes d'échanges entre les partenaires, il bénéficiera de l'existence d'une communauté scientifique nationale travaillant sur une thématique bien ciblée de manière conjointe, coordonnée, parfaitement reconnue et intégrée dans la politique agricole nationale. Le projet contribuera aux efforts engagés pour atteindre une production alimentaire améliorée, diversifiée et durable en République Centrafricaine. Il vise à protéger et à sécuriser les culture et en tenant dûment compte de la nécessité de préserver les ressources naturelles. Ces recherches auront des impacts positifs sur le niveau de vie et la santé de la population Centrafricaine.

#### **MISE EN OEUVRE**

##### **Arrangements institutionnels**

Le projet sera placé sous le Comité National de Pilotage de la CCNUCC, sous tutelle du MEFCEPE. Pour la mise en oeuvre effective, des ONGs locales seront associées à la Coordonnatrice nationale du projet. Les populations locales seront régulièrement consultées pour la mise en oeuvre.

##### **Suivi Evaluation**

- Un rapport trimestriel faisant état de l'évolution des cultures et le cas échéant de la production sera transmis aux Bailleurs;
- Des tournées sur le terrain seront organisées régulièrement en vue de rester en contact avec les populations locales bénéficiaires des retombés du projet;
- La production annuelle sera évaluée régulièrement d'un point de vue qualitatif et quantitatif.

##### **Risques**

Le projet ne présente pas de risques majeurs mis à part un retard dans le décaissement des fonds qui risquent de pénaliser le calendrier cultural.

##### **Durée**

**3ans**

#### **COÛT**

<i>USD 250,000 du FEM</i>
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**Autres financements:** A rechercher

# COMOROS

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## NAPA PRIORITY PROJECT NO. 1

### PROJECT SHEET NO. 1

#### INTRODUCTION OF VARIETIES THAT ARE MORE ADAPTED TO DROUGHT

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##### SECTOR

Agriculture

##### RATIONALE

Rises in temperatures and early and prolonged droughts lead to a reduction of food-producing crops, which remain the basis of national food and activity. Food-producing crops provide more than half of the agricultural GDP, which represents in itself 44% of the national GDP. In spite of this high percentage, local food production remains insufficient to meet domestic demand, which is constantly growing.

Important quantities of cereals are imported every year to compensate for this deficit. The negative economic growth per inhabitant and the subsequent increase of poverty, combined with climate variability make difficult the access to food for the most vulnerable groups. In order to face the reduction of the production of food-producing crops and facilitate the access of the poorest to food, it is necessary to multiply at least by two, the current level of the production of food-producing crops. Considering the low extension capacity of the cultivated surface areas, this increase should normally occur mainly through the increase of the crops productivity. The introduction of varieties that are more adapted to drought will enable to reduce production decrease, indeed increase the local production level. It will also contribute to food security by reducing food shortages and imports, thus lightening commercial deficit.

##### ZONES OF INTERVENTION

Hagnamoida, Itsamia, Nyoumachoua, Ndrondroni (Moheli); Sdapoini, Magomani, Barakani, Hasinka, Bandani, Sima – Bimbini, Milimajou Hadda, Mlimajou Pangani (Anjouan); Didjoni – Ifoundihe, Djongwe-Zidilher, Funga – Membwadjou, Madjeweni – Bambadjani, Sidjou-Idjinkoundzi, Mtsangadjou Pidjani (Grand-Comoro)

##### LINKS WITH ONGOING OR PROJECTED PROGRAMMES AND MULTILATERAL AGREEMENTS

Agricultural strategy, Poverty Reduction and Growth Strategy Paper (PRGSP)

##### RECIPIENTS

Small farmers and the poorest population from the rural and urban areas.

##### DESCRIPTION

##### **Objective**

To ensure the production and distribution of good quality seeds and varieties of food-producing crops (sweet potato, banana, cassava, tarot, leguminous plants, etc.), which are more adapted to drought.

**Activities**

The main activities will deal with:

- Supporting small farmers in producing and preserving seeds and varieties of food-producing crops which are more adapted to drought;
- To turn the production of seeds and more adapted varieties into a profitable economic activity.

**Implementation**

The implementation of the project will require the following inputs:

- Seeds and varieties that are more adapted to drought;
- Multiplication parcels;
- Equipment/set of tools;
- Water and phytosanitary products;
- Seeds preservation and distribution conditions;
- Financial resources, etc.

**Short term outputs**

The aim of the project is to set-up a bank for seeds and varieties that are more adapted to drought, to train and make producers into specialists, to reduce capacity losses, to increase the production of food-producing crops and facilitate a better access to food, for the most vulnerable groups.

**Long term outputs**

The project will contribute to food security, poverty alleviation and the lightening of the commercial balance through the reduction of food imports.

**IMPLEMENTATION****Institutional arrangement**

The project will be carried out by a multisectoral pilot committee for each island under the supervision of the Environment Ministry of the island, under the national coordination of the Union Ministry in charge of Environment.

**Risks and Barriers**

The limited technical ability of the actors, the possible delay in the mobilisation of resources, the lack of experience and the weak means of the newly set-up decentralised institutions, which will be in charge of supervising the project could constitute risks and obstacles that may limit the success of the project.

**Follow-up and evaluation indicators**

- The quantity and quality of the available seeds and more adapted varieties;
- The setting-up of a central buying office for more adapted seeds;
- The development of close-by food crops markets;
- The increase of the production of food-producing crops;
- Easier access of vulnerable groups to food.

**COST**

<i>USD 420 000</i>
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# COMOROS

NAPA PRIORITY PROJECT 9

PROJECT SHEET NO. 10

INTRODUCTION OF FISH CONCENTRATION MECHANISMS (FCM)

## SECTOR

Fisheries

## RATIONALE

Oceanic temperature rises have led to high coral mortality. In 1997, the rise from 1 to 1,5°C of the sea water temperature in relation with the normal temperature (26 to 28°C) has provoked the bleaching and the death of almost 60% of the corals on all the islands, 80% of them on the reef plate and 60% at the level of the external slope. Between 1998 and 2005, the rate of the bleaching observed on 20 stations, which follow up the health status of the reefs is of about 10%. (AIDE, 2005). The situation is translated by a regular diminution of the catches and a progressive increase of the access cost. The lack of motorised boats (1500) in relation with the number of fishermen (8000) does not allow access to deep-sea fishing. The introduction of Fish Concentration Mechanisms (FCM) enables to set the fishing zones in order to increase the catches and therefore the availability of fish, in order to face chronic shortages aggravated by climate variability, particularly heavy rains and cyclones, which limit fishing. It also enables to reinforce the country's initiatives and regional cooperation in the fight against poverty and food insecurity.

## ZONES OF INTERVENTION

Vanamboini, Ivoini, Itsoundzou, Chindini, Malé, Foubouni (Grand-Comoro) ;  
Maraharé, Moya, Ouani (Anjouan) ; Hoani, Ndrondroni, Wallah (Mohéli)

## LINKS WITH ONGOING OR PROJECTED PROGRAMMES AND MULTILATERAL AGREEMENTS

Annual Action Plan on the Fisheries sector;  
PRSP and PRGSP;  
COMESA fishing programme;  
Convention of the Tuna Commission of the Indian Ocean.

## RECIPIENTS

Fishermen and fishing cooperatives, the population.

## DESCRIPTION

### **Objective**

To increase fish availability in order to allow communities to face the shortages of the resource aggravated by climate variability.

### **Activities**

The activities will deal with:

- The locating of FCM anchorage points;
- Making and assembly of FCM;
- The setting-up and servicing of the FCM;



Training and education of fishermen on FCM.

The implementation of the project will require the followings:

- Fish Concentration Mechanisms ( FCS);
- Renting boats for the setting-up of FCS;
- Ecosounder and GPS;
- Bowls and coding.

#### **Short term outputs**

The aim of the project is to increase and improve the availability of fish, in order to allow communities to face the shortage of the resource aggravated by climate variability.

#### **Long term outputs**

The project will enable to reduce fishing pressure on the coast, and favour the reconstitution of demersal stocks, reduce risk of disappearance of fishermen at sea, in case of extremes of climate events, and reduce slow development which affects 44% of children. The project will contribute to reduce poverty and increase food security.

### **IMPLEMENTATION**

#### **Institutional arrangement**

The project will be carried out by a multisectoral pilot committee in each island, under the supervision of the Island Ministry of Environment and the technical collaboration of the Directorate for fisheries resources and the national collaboration of the Union Ministry in charge of Environment.

#### **Risks and Barriers**

The cyclonic events, the narrowness of the continental shelf, the sea currents and the possible pulling up of FCS by ships could constitute risks for the success of the project.

#### **Follow up and evaluation indicators**

- Number of FCMs installed and serviced and the productivity of the boats;
- Reconstitution of demersal stocks;
- Reduction of losses of human lives at sea;
- Reduction of children slow development;
- Number of trained fishermen;
- Setting-up of a critical threshold and follow-up of the evolution of .....

### **COST**

*Total: USD 144,000*

*Obtained: USD 12,000*

Amount to prospect USD 132,000

# COMOROS

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## NAPA PRIORITY PROJECT 11

### PROJECT SHEET NO. 11

#### SHORT CONSERVATION OF FISH UNDER ICE TO REDUCE LOSSES AFTER CATCHES, DUE TO HIGH TEMPERATURE

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##### SECTOR

Fisheries

##### RATIONALE

The increase of temperature (1°C) provokes the deterioration at sea of about 30% of the catches. Moreover, the lack of means of conservation, from the unloading moment to the distribution of fish aggravates the deterioration of the quality of the product and diarrhoea diseases linked to the consumption of rotting fish.

This situation leads to considerable losses of income for the fishermen and reduces the availability of the resource on the market, thus affecting health.

The access to the product becomes more and more difficult particularly for the poorest due to its high cost (4,5 USD/kg), in the face of an incidence of 44,8% of the total poverty of the individuals.

The short conservation of fish under ice will contribute to preserve the quality of the fish, to reduce diseases and to increase tidal times, and therefore the catches. It will allow to reduce the problem related to the poor's access to the resource and to support the efforts made by the authorities to this end.

##### AREAS OF INTERVENTION

Vanamboini, Mitsamiouli, Bouni (Grand-Comoro); Nioumachioi, Fomboni, Wanani (Moheli) ; Domoni, Ouani, Sima (Anjouan)

##### LINKS WITH ONGOING OR PROJECTED PROGRAMMES AND MULTILATERAL AGREEMENTS

Master plan on fishing  
Annual Action Plan of the fishing sector,  
PRSP and PRGSP  
COMESA Fishing Programme  
Convention of the Tuna Commission of the Indian Ocean

##### RECIPIENTS

Fishermen and women retailers; The fishing cooperatives; The population

##### DESCRIPTION

##### **Objective**

To ensure the refrigeration procedure, from the place of catches to the place of distribution, in order to reduce or avoid the deterioration of the fish after catches, because of temperature rises.

##### **Activities**

The making of ice silos and isotherm trays;

Assembly;  
 Ice production;  
 Supply of isothermal trays with ice;  
 Training of fishermen and women retailers on the techniques of conservation under ice and the servicing of the machines;  
 Dissemination of the conservation techniques.

#### **Inputs**

Ice machines;  
 Ice Silos and isothermal trays;  
 10 cm wide isotherm panels for the silos;  
 Isothermal doors;  
 Human resources  
 Financial resources.

#### **Short term outputs**

The aim of the project is to reduce losses after catches, increase the availability of fish and ensure a good quality of the product, to improve fishermen income, health and access to the product by the destitute.

#### **Long term outputs**

The project will enable to ensure the availability of fish for a long period of the year and reduce shortages, in case of extreme s of climate events preventing fishing. The project will contribute to ensure food security, reduce poverty, and secure employment for fish women retailers who, most of the time, are heads of one-parent families and, to consolidate actors' know-how of the techniques for the conservation and hygiene. It will enable to reduce children slow development, the current rate of which is of 44%.

### **IMPLEMENTATION**

#### **Institutional arrangement**

The project will be carried out by a multisectoral pilot committee in each island, under the supervision of the Island Ministry of Environment, with the technical collaboration of the Directorate for fisheries resources and the national coordination of the Union Ministry in charge of Environment.

#### **Risks and Barriers**

Frequent power cuts constitute factors that can limit the success of the project.

#### **Follow-up and evaluation indicators**

Rate of the reduction of the losses after the catches  
 Quality of the product sold on the market;  
 Increase of the availability of fish on the market ;  
 Increase rate of the fishermen income;  
 Accessibility of the product by a larger number  
 Degree of appropriation of the technique of conservation under ice  
 Number of towns and fishermen who benefit from the services.

### **COST**

<i>Total: 336.000 USD</i>
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*Obtained: 28.000 USD*

*Amount to prospect : 308.000 USD*

# COMOROS

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NAPA PRIORITY PROJECT 12

PROJECT SHEET NO. 9

PRODUCTION OF PROVENDER FOR POULTRY FARMING

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## SECTOR

Poultry farming

## RATIONALE

The geographic position of the Comoros predisposes the country to tropical cyclones. The evolution of climatic conditions has led to an increase of their frequency, moving from one cyclone every two years to an annual tendency since 1987. This situation, combined with the distance of the international markets and the high transportation costs, leads to sea links difficulties and is likely to aggravate food shortages, particularly meats, whereas the local production covers only 40% of the needs in animal proteins.

The production of provender favours the development of intensive poultry farming in order to reduce the shortages in animal proteins linked to the irregularity of boats, which are due, in their turn, to the increase of frequent extremes of climate events. It will enable to develop employment through production and marketing.

The creation of a provender production unit, although it will rely on imported raw materials (corn, Soya, mineral, vitamin and protein complements), will enable a competitive cost price compared to the local production of the same raw materials. Indeed, corn competes with the consumption needs of the population. The storage of imported raw materials will enable to reduce shortage risks linked to the disturbance of the sea and air links which are caused by cyclones or other extreme of climate events and will thus favour the continuous production of chicken and eggs.

## ZONES OF INTERVENTION

Island of Ngazidja (for the supply of poultry exploitations in the three islands)

## LINKS WITH ONGOING OR PROJECTED PROGRAMMES AND MULTILATERAL AGREEMENTS

Support Programme to Professional Organisations in the Comoros (PAOPAC);  
 Support Programme to the Development of Cattle-raising in the Comoros (PADEC);  
 Comoros Local Development Programme;  
 Arab Authority for Investment and the Development of Agriculture (AAIAD);  
 Poverty Reduction Strategy Paper (PRSP);  
 Special Food Security Programme (SPFS).

## RECIPIENTS

The main recipients are the small poultry farmers; the unemployed; the population.

## DESCRIPTION

### Objective

To increase the production of chicken and eggs.

### Activities

The main activities will deal with:

- Constitution of a national grouping of Comorian Poultry farmers (GNAC) from 3 existing groupings: Association of Comorian Poultry farmers (ASAVIC Ngazidja), Union of Groupings of Anjouanese Poultry farmers (UGAA) and the Association of Producers of Poultry farming of Mwali (ASPAVIM);
- Construction of a provender unit;
- Purchase and installation of equipments;
- Training of technical staff;
- Launch of the production.

The implementation of the project will require the following inputs:

- Infrastructure;
- Equipments;
- Training;
- Acquisition of the first stock of raw materials;
- Financial resources.

### Short term outputs

The aim of the project is to ensure the availability of the necessary food for poultry farming (eggs, meat and poultry) and to reduce the risks of shortages related to the disturbances of sea links by the extremes of climate events, which have become more frequent.

### Long term outputs

The project will allow to improve the productivity of intensive poultry farming and the supply of eggs, meat and poultry to the population. It will also enable to develop proximity jobs, fight poverty and reduce children slow development and difficulties for the poorest to have access to animal proteins.

## IMPLEMENTATION

### Institutional arrangement

The project will be carried out by a multisectoral pilot committee in each island, in partnership with the groupings of poultry producers under the supervision of the island Ministry of Environment, and under the technical supervision of the Department of Cattle-raising, in collaboration with NGOs specialized in the sector, under the national coordination of the Union Ministry of Environment.

The possible degradation of climate conditions can lead to delays in the supply of raw materials and reduce poultry production. The weaknesses of the country in mobilizing costs could also constitute an obstacle to the realization of the project.

### Follow-up and evaluation indicators

- Quantity of produced provender;
- Level of local production compared to imports;
- Quantity of meat and chicken produced every year;
- Number of poor households with access to poultry products.

### COST

<i>USD 90,000</i>
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# COMOROS

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**NAPA PRIORITY PROJECT 13**  
**PROJECT SHEET NO. 8**  
**FODDER PRODUCTION FOR GOAT BREEDING**

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SECTOR

Cattle-raising

RATIONALE

Early and prolonged droughts accelerate soils degradation and lead to the diminution of the quantity and the deterioration of the quality of fodder as well as to changes in the areas of geographic distribution of a certain number of fodder species, in response to the evolution of climatic conditions. Moreover, in some regions, the unreasonable use of the wood and plant cover (intensive cut of leafy branches, logging for the reinforcement of fences) has accentuated the degrading of pastures and soils.

This situation particularly affects goat breeding which constitutes the main source of income for the peasants and makes more and more difficult the access to meat, particularly for the poorest.

The increase of the quantity and quality of fodder enables to improve the productivity of traditional intensive and extensive breeding in the villages.

This action also allows to protect the woody and herbaceous covers of the existing pastures, regenerate degraded soils and limit the physical degradation of sloppy soils through the defence and a reasonable management of pastures, trees and small fodder trees plantations (leguminous and others) around the goats pen enclosures, and parcel of fodder grasses.

ZONES OF INTERVENTION

Island of Ngazidja: Hambou region;  
 Island of Ndzuwani : Kangani and Pomoni;  
 Island of Mwali: Itsamia.

LINKS WITH ONGOING OR PROJECTED PROGRAMMES AND MULTILATERAL AGREEMENTS

Support programme to the development of cattle-raising in the Comoros (PADEC);  
 Comoros Local Development Programme;  
 Arab Authority for Investment and Agricultural Development (AAIAD);  
 Poverty Reduction Strategy Paper (PRSP);  
 Special Food Security Programme (SFSP).

RECIPIENTS

The main recipients are the small goat breeders and the population, to whom goat meat will become cheap and have better quality.

## DESCRIPTION

### **Objective**

To increase the availability of fodder and improve the quality of the pastures as well as the productivity of goat breeding.

### **Activities**

The main activities will deal with:

- Constitution of groupings of goats breeders exploiting the same pasture ;
- Training of goat breeders to the techniques of defence and reasonable management of community pastures;
- Plantation of fodder trees around the goats pen enclosures and in the natural pastures;
- Seedbed of improved fodder grains in the natural pastures to be regenerated.

The implementation of the project will require the following inputs:

- Plant materials (tree stumps, fodder grains, plants, cuttings);
- Set of tools;
- Trainers;
- Human resources.

### **Short term outputs**

The aim of the project is to increase the quantity of fodder and improve its quality, which are affected by the modifications of climatic conditions. It will also enable to improve the productivity of goats breeding, in order to reduce difficulties by the poor populations to have access to animal proteins.

### **Long term outputs**

The project aims at limiting the impact of climate variability on goats breeding through the regeneration of degraded soils, the fight against erosion and the disappearance of plant cover. It will enable to increase farmers' income and food security and to reduce children slow development and dependency towards imports.

## IMPLEMENTATION

### **Institutional arrangement**

The project will be carried out by a multisectoral pilot committee in each island in partnership with the groupings of goat producers, under the supervision of the island Ministry of Environment and the technical supervision of the Department of cattle-raising, in collaboration with NGOs specialised in the sector, under the National Coordination of the Union Ministry of Environment.

### **Risks and Barriers**

The possible degradation of climate conditions can limit the regeneration of pastures; the strong demand in goat meat is likely to lead breeders to neglect the reasonable management of the pastures, because of immediate and significant gains. As the joint management of pastures between breeders is a little bit common, it might bring about difficulties as for the reasonable management of the pastures.

### **Follow-up and evaluation indicators**

- Number of acres of the regenerated plant and woody cover;
- Quantity and quality of the available fodder;
- Number of goats produced every year;



Number of trained breeders.

COST

*USD 100,000*

# DEMOCRATIC REPUBLIC OF CONGO

## NAPA PRIORITY PROJECTS NO. 2

### RENFORCEMENT DE LA CAPACITÉ DE PRODUCTION AGRICOLE

#### MULTIPLICATION DES SEMENCES AMELIOREES DE MAÏS

	Libelle	Indicateurs
But du projet	Permettre aux communautés de base de disposer des semences résistantes aux maladies, à grand rendement et adaptées aux changements climatiques – voir contraintes dus par exemple au raccourcissement de la saison des pluies.	<ul style="list-style-type: none"> <li>• Nombre de personnes Concernées: &gt; 20 000 000;</li> <li>• Personnes directement concernées: Petits exploitants agricoles.</li> </ul>
Objectif du projet	<p>Multiplier 7 variétés de semences de maïs: KASAI I, SALONGO 2, SAMURU, SHAABA 1, BANDUNDU, BABUNGO 3, et MUS – 1, toutes des variétés très performantes en milieu paysan avec un potentiel de 1,5 à 5 T / ha ( selon INERA) pour:</p> <ul style="list-style-type: none"> <li>• Accroître la production d'une denrée alimentaire de base pour plus de vingt millions de personnes au pays;</li> <li>• S'adapter aux perturbations de cycles saisonniers (variétés à croissance rapide et à cycle végétatif court).</li> </ul>	<p>Sources:</p> <ul style="list-style-type: none"> <li>• Ministère de la Recherche Scientifique: INERA;</li> <li>• Ministère de l'agriculture: SENASEM, SNSA, DEP;</li> <li>• Ministère du Plan, Direction de la Programmation et Budgétisation; Bureau, d'archives, DSRP.</li> </ul> <p>Méthodes:</p> <ul style="list-style-type: none"> <li>• Enquête sur terrain;</li> <li>• Dépouillement des archives.</li> </ul>
Activités et resultants escomptés	<ul style="list-style-type: none"> <li>• Identification des sites de production de semence améliorée de Maïs;</li> <li>• Achat des semences améliorées;</li> <li>• Acheminement des semences dans les sites de multiplication;</li> <li>• Préparation du terrain;</li> <li>• Réfection et/ou Construction des hangars de stockage;</li> <li>• Opérations culturales: Fauchage, Dégagement...récolte (voir location d'un tracteur);</li> <li>• Distribution auprès des</li> </ul>	<ul style="list-style-type: none"> <li>• Nombre de sites opérationnels: 7;</li> <li>• ombre de tonnes de semences de Maïs: 1,5 à 5 T / ha /saison;</li> <li>• Nombre des partenaires intermédiaires servis: 5000/site;</li> <li>• Durée: 4 saisons culturales ou 2 ans calendriers.</li> </ul>

	partenaires intermediaries; <ul style="list-style-type: none"> <li>• Réduction des pertes dues aux événements climatiques.</li> </ul>	
APPORTS	Moyens humains <ul style="list-style-type: none"> <li>• Nombre d'agronomes;</li> <li>• Mécaniciens et Chauffeurs (Voir Budget);</li> <li>• Moyens Financiers:</li> </ul>	Moyens Matériels tracteur; semences; intrants agricoles (engrais, produits, phytosanitaires); petits outillages (Voir Budget); Matériels de télécommunication (Internet); Matériel de transport (Déplacement).

**COÛT DU PROJET MAIS**

Nombre de sites: 7

Nombre de saisons: 4 (2 ans)

Nombre total d'ha: 10

Nombre d'habitants par site: 10

**Production des semences/ha**

LIBELLE	Quantité	Coût unitaire/ha/saison (USD)	Coût total (USD)/saison (pour 10 ha)
<b>1. Préparation du terrain:</b>	1	200	2 000
Location d'un tracteur			
<b>2. Fourniture des intrants</b>			
Achat de semences neuves	1	1	250
Engrais	25 kg	0.5	2 000
Insecticide	400 idem	10	1 000
Herbicide	10 idem	25	2 500
Sacherie	10 idem	10	500
Ficelle	5 idem	0.6	1 200
Etiquettes	200 idem	10	200
Carburant	2 idem	0.1	330
Lubrifiant	330 litres	0.6	900
Jeep pick-up	150 litres	45.000	45 000
<b>Main d'oeuvre</b>	2 personnes	50	1 000
Mécanisation			
Epuration			
Epannage urée			
Contrôle mauvaises herbes			
Récolte			
Conditionnement			
Manutention			
<b>Suivi technique</b>			

<u>Personnels agricoles</u>			
agronome	1	500/saison	2 000
technicien	2	200/saison	1 600
Chauffeur	1	150/saison	600
Mécanicien	1	150/saison	600
Transport récolte		500/saison	2 000
Outillage			
machette	50	20	1 000
râteaux	50	10	500
bêches	10	10	100
décamètre	1	20	20
Corde Nylon (100)	1	30	30

*Coût unitaire: USD 65.330 / saison pour 10 ha / site*

*Coût total par site: 65.330 x 4 saisons = USD 261.320*

*Coût global du projet: 261.320 x 7 SITES = USD 1.829.240*

#### MULTIPLICATION DES SEMENCES AMELIOREES DE RIZ

	Libelle	Indicateurs
But du projet	Permettre aux communautés de base de disposer des semences résistantes aux maladies, à grand rendement et adaptées aux changements climatiques – voir contraintes dus par exemple au raccourcissement de la saison des pluies.	Nombre de personnes Concernées: 15 000 000; Personne directement Concernées: Petits exploitants agricoles.
Objectif du projet	Multiplier 13 variétés de semences du riz pluvial et des bas fonds ayant fait des preuves d'un bon comportement et aussi démontré suffisamment leurs performances d'après INERA, à savoir le CIPI, JASMIN, R41(IRA T2), RY7 (IRA T13), RY150 (IRA T13), RY150 (IRA T112), R66, RY140 , NERICA4 et NERICA7 – variétés pluviales dont le rendement varie entre 1,5 à 2T/ha – , IR57924-9, et IT47701-6-B-1 (variétés des bas fonds) pour: Accroître la production <ul style="list-style-type: none"> <li>• S'adapter aux perturbations de cycles saisonniers</li> </ul>	Sources Ministère de la Recherche Scientifique: INERA; Ministère de l'agriculture: SENASEM, SNSA, DEP; Ministère du Plan, Direction de la Programmation et Budgétisation; Bureau, d'archives, DSRP; Méthodes: Enquête sur terrain; Dépouillement des archives.

Activités et resultants escomptés	Identification des sites de production de semences améliorées de Riz; Achat des semences améliorées; Acheminement des semences dans les centres de multiplication; Préparation du terrain; Réfection et/ou Construction des hangars de stockage; Opérations culturales: Fauchage ..., Récolte et transport de récolte; Distribution auprès des intermédiaires	Nombre de sites opérationnels: 8; Nombre de tonnes de semences de Riz: 1,5 – 2T ha/saison/site; Nombre des Partenaires intermédiaires servis: 5.000 /site; Durée: 4 saisons culturales ou 2 ans.
APPORTS	Moyens humains Nombre d'agronomes; Mécaniciens et Chauffeurs. Voir BUDGET Moyens Financiers:	Moyens Matériels tracteur; semences de riz (améliorées); intrants agricoles (engrais, produits, phytosanitaires) outillages; Matériels de telecommunication; Voir BUDGET Moyen de transport (Déplacement); Matériel d'irrigation.

**COÛT DU PROJET RIZ**

Nombre de site: 8  
 Nombre de saisons: 4(2 ans)  
 Nombre total de ha / site: 5  
 Nombre d'habitants par site: 10

**Production des semences du riz/ha**

LIBELLE	Quantité	Coût unitaire/ha/saison (USD)	Coût total (USD)/saison (pour 5 ha)
<b>1. Préparation du terrain:</b>			
Location d'un tracteur	1	200	1 000
<b>2. Fourniture des intrants</b>			
Achat de semences neuves	25 kg	1	125
Engrais	400 idem	0.5	1 000
Insecticide	10 idem	10	500
Herbicide	10 idem	25	1 250
Sacherie	5 idem	10	250
Ficelle	200 idem	0.6	600
Etiquettes	2 idem	10	100
Carburant	330 litres	0.1	165
Lubrifiant	150 litres	0.6	450
Jeep pick-up	1	45 000	45 000

<b>Main d'oeuvre</b>	2 personnes	50	500
Mécanisation			
Epuration			
Epannage urée			
Contrôle mauvaises herbes			
Récolte			
Conditionnement			
Manutention			
<b>Suivi technique</b>			
<u>Personnels agricoles</u>			
Agronome	1	500/saison	1 000
Technicien	2	200/saison	800
Chauffeur	1	150/saison	300
Mécanicien	1	150/saison	300
Transport récolte		500/saison	1 000
<b>Outillage</b>			
machette	50	20	500
râteaux	50	10	250
bêches	10	10	50
décamètre	1	20	10
Corde Nylon (100)	1	30	15

*Coût unitaire: 55.165 US\$ / saison pour 5 ha / site*

*Coût total par site: 55.165 US \$ x 4 saisons = USD 220,660*

*Coût global du projet: 220.660 US \$ x 8 SITES = USD 1,765,280*

#### MULTIPLICATION DES BOUTURES AMELIOREES DE MANIOC

	Libelle	Indicateurs
But du projet	Permettre aux communautés de base de boutures de manioc résistantes aux maladies, à grand rendement et adaptées aux changements climatiques – voir contraintes dus par exemple au raccourcissement de la saison des pluies et aux pathologies inhérentes.	<ul style="list-style-type: none"> <li>• Nombre de personnes Concernées: &gt; 20.000.000</li> <li>• Personne directement Concernées: Petits exploitants agricoles</li> </ul>
Objectif du projet	Multiplier 11 variétés de manioc répondant aux descriptions ci-dessus , à savoir KINUANI, TSHILOBO, F100, MVUAMA, SADISA, RAV, LUEKI, PAPAYI, MAHUNGU, LIZILA, MVUAZI, NSANSI, BUTAMU et DISANKA	Sources:-Ministère de la Recherche Scientifique et Technique: INERA -Ministère de l'agriculture: SENASEM, SNSA, DEP; -Ministère du Plan, Direction

	<p>pour: Accroître la production;</p> <ul style="list-style-type: none"> <li>• S'adapter aux perturbations de cycles saisonniers.</li> </ul>	<p>de la Programmation et Budgétisation; Bureau, d'archives.</p> <p>Méthodes: Enquête sur terrain;</p> <ul style="list-style-type: none"> <li>• Dépouillement des archives.</li> </ul>
Activités et resultants escomptés	<ul style="list-style-type: none"> <li>• Identification des sites de production de boutures de Manioc;</li> <li>• Achat des boutures saines;</li> <li>• Acheminement des boutures dans les sites de multiplication;</li> <li>• Préparation du terrain;</li> <li>• Réfection et/ou Construction des hangars de stockage;</li> <li>• Opérations culturales: Fauchage, Dégagement...récolte;</li> <li>• Distribution des boutures auprès des partenaires intermédiaires.</li> </ul>	<ul style="list-style-type: none"> <li>• Nombre de sites opérationnels: 9;</li> <li>• Nombre de km de boutures: 20 km / ha /saison;</li> <li>• Nombre des partenaires intermédiaires servis: 10.000 / site;</li> <li>• Durée: 4 saisons (2 ans calendrier).</li> </ul>
APPORTS	<p>Moyens humains Nombre d'agronomes; Mécaniciens et Chauffeurs (Voir Budget); Moyens Financiers.</p>	<p>Moyens Matériels tracteur; Boutures; intrants agricoles (engrais, produits, phytosanitaires); outillages (Voir Budget); Matériels de télécommunication (Internet); -Matériel de transport (Déplacement).</p>

**COÛT DU PROJET MANIOC**

Nombre de sites: 9  
 Nombre de saisons: 4 (2ans)  
 Nombre de ha par site: 5  
 Nombre d'habitant/site: 10

**Production des boutures de manioc/ha/saison**

LIBELLE	Quantité	Coût unitaire/ha/saison (USD)	Coût total (USD)/saison (pour 5 ha)
<b>1. Préparation du terrain:</b>	1	200	1 000
Location d'un tracteur			
<b>2. Fourniture des intrants</b>			
Achat de boutures neuves	2 500 m	0.04	500
Engrais	400 idem	0.5	1 000
Insecticide	10 idem	10	500
Herbicide	10 idem	25	1 250

Sacherie	5 idem	10	250
Ficelle	200 idem	0.6	600
Etiquettes	2 idem	10	100
Carburant	330 litres	0.1	165
Lubrifiant	150 litres	0.6	450
Jeep pick-up	1	45 000	45 000
<b>Main d'oeuvre</b>	2 personnes	50	500
Mécanisation			
Epuration			
Epannage urée			
Contrôle mauvaises herbes			
Récolte			
Conditionnement			
Manutention			
<b>Suivi technique</b>			
<u>Personnels agricoles</u>			
Agronome	1	500/saison	1 000
Technicien	2	200/saison	800
Chauffeur	1	150/saison	300
Mécanicien	1	150/saison	300
Transport récolte		500/saison	1 000
Outillage			
machette	50	20	500
râteaux	50	10	250
bêches	10	10	50
décamètre	1	20	10
Corde Nylon (100)	1	30	15

*Coût unitaire: 57.340 US\$ / saison pour 5 ha / site*

*Coût total par site: 57.340 US \$ x 4 saisons = USD 229,360*

*Coût global du projet: 229.360 US \$ x 9 SITES = USD 2,064,240*

TOUS LES PROJETS CI-DESSUS SONT CONFRONTES AUX MEMES CONTRAINTES: L'INSTABILITE POLITIQUE, ET LE DELABREMENT DES VOIES DE COMMUNICATION. TOUTEFOIS, LES ECHEANCES ELECTORALES EN COURS FONT ESPERER UNE AMELIORATION SIGNIFICATIVE DE LA SITUATION. VU L'IMPORTANCE DE CES PROJETS POUR LE NOUVEAU GOUVERNEMENT, IL Y A LIEU DE CROIRE QUE LES AUTORITES TANT POLITIQUES QU'ADMINISTRATIVES CONCOURONT A LEUR REUSSITE.



# DJIBOUTI

## NAPA PRIORITY PROJECT NO. 4

### AMÉLIORATION DE LA GESTION DES PARCOURS POUR RÉDUIRE LES RISQUES ASSOCIÉS À L'ÉLEVAGE EXTENSIF TRADITIONNEL

#### BUT DU PROJET

Amélioration de la régénération naturelle des pâturages pour réduire la vulnérabilité des régions du Nord-ouest du district de Tadjourah (arrondissement de Dorra) et la région d'Assamo du district d'Ali-Sabieh aux changements et variabilité climatiques.

#### DESCRIPTION DE LA SITUATION ACTUELLE DES SITES DU PROJET

##### Environnement physique de la zone du projet

Les sécheresses récurrentes de ces dernières décennies en République de Djibouti ont fragilisé davantage les parcours et le cheptel enregistre des pertes énormes. En effet, la processus de la désertification est assez avancé sur les sites du projet qui sont les plus affectés: région du Nord-ouest du district de Tadjourah (arrondissement de Dorra) et la région d'Assamo du district d'Ali-Sabieh. Ces régions se caractérisent principalement par:

- Le déficit hydrique: l'hyperaridité du climat perturbe sérieusement les complexités biologiques des terres de parcours rendant l'écosystème vulnérable;
- Le surpâturage: la concentration des troupeaux autour des points d'eau fixes et des centres urbains secondaires entraîne une raréfaction des espèces végétales de bonne qualité en raison de la surcharge des parcours qui se traduit par un prélèvement par le cheptel d'une quantité d'unité fourragère supérieure à la capacité de régénération naturelle.

Cette situation entraîne une diminution ou disparition des espèces herbacées et ligneuses de bonne valeur.

##### La situation socioéconomique de la zone du projet

L'élevage transhumant constitue la principale source de revenu des populations des sites. La dégradation du milieu a comme conséquence une faible productivité des parcours, un affaiblissement du cheptel exposé aux maladies. Aussi, la désertification a un impact négatif sur les conditions de vie de la population qui souvent n'ont d'autre alternative que l'exode vers les centres urbains où réside déjà près de 75 % de la population nationale

#### ANALYSE ET JUSTIFICATION AU REGARD DE SES LIENS AVEC LES ANGENEMENTS CLIMATIQUES ET SECTEURS CONCERNES:

Du fait des périodes de sécheresse fréquentes, le bétail exerce une pression de plus en plus forte sur les ressources végétales et les conséquences sont une surexploitation entraînant un affaiblissement des animaux avec une mortalité accrue et un faible rendement. Cette situation est aggravées par les méthodes de gestion irrationnelles (continue) des parcours et les facteurs anthropiques (déboisement, etc).

Le projet permettra de rétablir l'équilibre qui existe entre les besoins de la population en ressources végétales (en particulier pour le fourrage des pâturages, la cueillette de fruits et gousses et le bois de chauffe) et les capacités de régénération de la végétation.

Si aucune mesure n'est entreprise, la dégradation des parcours sera irréversible avec toutes les conséquences que cela implique: paupérisation croissante des éleveurs nomades qui n'auront d'autre solution que de venir agrandir les miséreux des centres urbains et particulièrement de la capitale où réside déjà près de 65 % de la population nationale.

### DESCRIPTION

#### Objectifs et activités

- Amélioration de la productivité des pâturages et du système traditionnel de gestion continue des parcours;
- La mise en place de système de mis en défens temporaire et rotative permettant la constitution de réserve fourragère en période de soudure ou de sécheresse;
- Structuration ou renforcement des éleveurs en groupements coopératifs;
- Formation des éleveurs aux techniques rationnelle d'élevage;
- Formation d'auxiliaires vétérinaires issus des communautés locales.

#### Intrants

Le projet requiert des ressources additionnelles humaines, financières et physiques qui seront détaillées dans la proposition de projet finale.

#### Résultats à court terme

- Gestion des parcours collectifs améliorée grâce à la mise en place de mis en défens dans les zones de pâturage habituel;
- L'organisation des éleveurs nomades en coopérative;
- Les éleveurs cibles sont initiés aux techniques d'élevage rationnel (déstockage des troupeaux, soins vétérinaires, etc.);
- Auxiliaires d'élevage formés au sein des communautés locales.

#### Résultats potentiels à long terme

- Les parcours se régénèrent avec une reprise des espèces fourragères;
- Des réserves de fourrage sont constituées au niveau des sites;
- Les rendements des animaux s'améliorent;
- Les éleveurs nomades sont mieux structurés et formés.

### MISE EN OEUVRE

#### Arrangements institutionnels

Les communautés assureront la gestion du projet par l'intermédiaire de leurs groupements coopératifs existants ou à créer des sites pilotes. Les activités seront encadrées par le Ministère de l'Agriculture, de l'Elevage et de la Mer, plus particulièrement la Direction de l'Elevage et des Services Vétérinaires en collaboration avec les autres autorités compétentes (Commissaires de la République, Conseils régionaux). Les techniciens compétents dans le domaine de l'agro- foresterie et de la santé animale seront les encadreurs de ce projet et un coordinateur national sera désigné.

### Risques et obstacles

Les risques sont limités et peuvent concerner le degré d'appropriation et de participation des éleveurs aux activités.

### Evaluation et suivi

Un comité de pilotage intersectoriel du projet composé des institutions nationales et des associations des éleveurs procédera au suivi et à l'évaluation du projet. Le coordinateur du projet fournira régulièrement des rapports au comité. Le comité de pilotage va mettre en place une cellule chargée du suivi évaluation

### Ressources financières

Ce projet est de type indépendant (*stand alone project*) car aucune action n'est envisagée par le pays dans un proche avenir pour changer la situation. Le coût additionnel couvre donc la totalité du budget de l'action proposée.

#### PLAN DE FINANCEMENT

**Total: USD 1 700 000**

(1USD = 170 FD)

	USD
Gestion des parcours	530 000
Travaux de mise en défens des zones de pâturage	680 000
Structuration et organisation des éleveurs	100 000
Formation des éleveurs aux techniques d'élevage rationnel	90 000
Formation et équipement des Auxiliaires vétérinaires locaux	300 000
<b>Total</b>	<b>1 700 000</b>
<b>Ligne de base</b>	<b>0</b>
<b>GEF</b>	<b>1 700 000</b>

# ERITREA

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## NAPA PRIORITY PROJECT 1

### INTRODUCING COMMUNITY BASED PILOT RANGELAND IMPROVEMENT AND MANAGEMENT IN SELECTED AGRO-ECOLOGICAL AREAS IN THE NORTH WESTERN LOWLANDS RANGELAND

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#### PROJECT AREA

The north-western lowland, a hot arid region with extreme rainfall variability and frequent drought years, is the geographic focus for this project. The vegetation is of the savannah type and the topography is flat plain crossed by major ephemeral rivers flowing from the central highland area. The populations are pastoralists, hence their livelihood is almost exclusively dependent on livestock. The production system is featured with extensive seasonal movement to cope with shortage of feed and water. However, the system is becoming less sustainable and as a result the pastoralists are impacted by the low animal productivity and because many animals are lost due to starvation and lack of drinking water. The rangeland, the pastoral system and the livelihoods of the pastoralists in the project area are highly vulnerable to climate variability, extreme events such as drought and climate change. The most vulnerable populations in the project area are those thriving in the Kerkebet area. In general, 6 villages, 200 HH/village and 20,000 ha of rangeland will be covered by this project.

#### RATIONALE

The pastoralists in the project area are dependent on livestock for their livelihood. The extensive livestock production system has however failed to sustain their livelihood because the productive and reproductive efficiencies have been declining progressively and direct losses of animals due to lack of feed and water during the dry season and drought years have been increasing. The rangeland has been negatively affected by climate variability, drought and climate change where the total biomass has been decreasing sharply and the nutritive plant species have been replaced by plant species and associations of less nutritive value. The traditional coping practice of animal movement in search of water and feed has been disturbed by land use change and climate variability. As a sequel to this, the rangeland is currently unable to sustain profitable livestock production and because of this the system is not capable to sustain the livelihood of the pastoralists. This project has been designed to adapt the livestock system into the new conditions produced by climate variability and frequent droughts. The strategy is to increase feed and water supply for the long dry season and establish community based rangeland management system. This is expected to improve the productive efficiencies of the livestock and decrease the direct losses of animals due to starvation and thirst. In this way, the pastoral system will be intensified, avoiding long distance movement, to become more sustainable allowing also the pastoral households more time for other activities.

#### DESCRIPTION

##### **Objectives:**

The immediate objectives are to:

- improve rangeland productivity;
- improve livestock productivity (milk and meat);
- increase incomes of the pastoralists;

through these:

- establish livelihood of the pastoralists on a sustainable basis;
- improve nutrition of the population and in particular children.

**Activities:**

- Preparing detailed strategy design and implementation plan;
- Construction of soil/water conservation and small stream diversion structures on the rangeland;
- Reseeding of the rangeland with suitable grass and legume species;
- Constructing water points and equipping them;
- Establishing community based rangeland and water management systems;
- Training of communities in managing their resources;
- Providing mineral supplement to improve animal nutrition;
- Providing machinery for forage conservation and rangeland maintenance;
- Monitoring and evaluation.

**Short-term outputs**

1. Strategy design prepared;
2. Sustainable forage supply system established;
3. Water supply system present;
4. Forage conservation system established;
5. Community institution for resources management established;
6. Local personnel trained for specific skills available;
7. Monitoring and evaluation system established.

**Potential long -term outcomes**

1. Pastoral communities will be able to cope with climate change by adapting the conditions of feed and water supply to become sustainable;
2. Establishing improved livestock production model through intensification of the pastoral system;
3. Improve food security and nutrition through increased incomes and food availability;
4. Reduce poverty.

**IMPLEMENTATION**

The main implementing body will be the Ministry of Agriculture through its regional office and its structure. The communities and the local government will participate in preparing the strategy design, implementing and monitoring and evaluation.

**Risks and Barriers**

Key risks are associated with Rangeland allocation for specific community use avoiding free access of others, as well as the technical Capacity of the Ministry of Agriculture.

**Monitoring and Evaluation**

The project will prepare a monitoring and evaluation system and this function will be jointly carried-out by the Ministry of Agriculture, the community and the local government.

**Project duration**

3 years starting from the time funds made available.

**COST**

The project will be the main source of finance; however, the Ministry of Agriculture will contribute for certain activities such as extension services and the local government in organizing the communities.

*USD 7,230,000*

**Cost estimates to improve rangeland for sustainable livestock production**

<b>Project Components</b>	<b>Cost (USD)</b>
Preparation of detail strategy design	120 000
Soil/water conservation on rangeland	2 800 000
Small stream diversion structures	1 300 000
Reseeding	900 000
Padlocking	1 100 000
Machinery	700 000
Construction and equipping water points	240 000
Establishing community institution	40 000
Monitoring and evaluation	30 000
<b>Total</b>	<b>7 230 000</b>

# ERITREA

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## NAPA PRIORITY PROJECT 2

### INTRODUCING COMMUNITY BASED PILOT PROJECTS TO INTENSIFY EXISTING PRODUCTION MODELS, AREA AND SPECIES SPECIFIC IN EASTERN LOWLANDS SELECTING SUITABLE SHEEP AND GOAT BREEDS

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#### PROJECT AREA

An eastern coastal lowland area, the most arid in Eritrea, is the geographic focus of this project. Rainfall in this region is generally very low and with extreme variability and frequent droughts. The vegetation type is of the steppe and desert like shrubs; while the topography is flat plain intercepted by some hills. The plain is crossed by several ephemeral rivers and streams flowing from the eastern escarpment and highlands. The pastoralists move towards the escarpments during the dry hot season as a coping mechanism for shortage of feed and water. The population in these coastal areas is basically pastoralist and their livelihood is dependent on livestock. The livestock species raised are mainly browsers such as goats and camels; while the grazers such as cattle are increasingly becoming insignificant source of livelihood. The cause for this is the progressive decline of grasses due to climate variability and drought. The livestock numbers are also continuously decreasing due to lack of feed and drinking water and considerable number of them dying each year. In these areas, livestock productivity is poor and the trend is negative. The rangeland is unable to sustain livestock and as a result the livelihood of the population is very vulnerable to climate change. In the project area, the most vulnerable populations are those communities living between Zula and Tio areas. Generally, six villages, 1200 Households (HHs), 6000 population, 400 ha/village, and 6 spate irrigation sites in the eastern lowlands will be covered by this project.

#### RATIONALE

The pastoral system in the project area is failing to sustain the livelihood of the pastoralists. This is because the rangeland is vulnerable to climate variability, drought and climate change. The extensive pastoral system of production in the project area is not any more sustainable and the communities have failed with their coping mechanism which involved seasonal animal movement between their villages in the lowland and the corresponding eastern escarpment. The composition of animal species had been altered where grazers are not produced any more except some desert type sheep breeds. The only animal species that are being able to resist the impacts of climate variability and drought are some varieties of goats and sheep. The exiting extensive livestock system and production models should be intensified to the degree that they are sustainable and have the capacity to become sustainable source of livelihoods. The general coping strategy should be by using the most efficient varieties of goat and sheep, keeping their numbers to correspond the available feed and increasing the individual animal productivity. This project is designed to enable the pastoralists to cope with the impacts of climate variability, drought and climate change by intensifying the pastoral system. The elements of the strategy will be by using selected varieties of small ruminants that are more suitable for the project area that is vulnerable to climate change. The system will be further intensified by producing feed under spate irrigation and providing drinking water sources.

## DESCRIPTION

### Objectives

1. Increase incomes of the population by reducing direct loss of animals due to lack of feed and water and by increasing individual animal production and productivity efficiency through the use of selected breeds and improved management;
2. Improve nutrition of the population by producing protein food of high biotic value such as milk and meat;
3. Enable the communities to cope with the current impacts of climate variability and drought and future climate change.

### Activities

The main activities will include selection and breeding of suitable varieties of indigenous goat and sheep breed types, evolving suitable breeding males, establishing sustainable animal feed and water supply, and organizing and training of communities.

1. Selecting dual purpose breeding goats;
2. Selecting sheep for higher mutton production;
3. Selecting suitable forage seeds;
4. Providing tools for pasture maintenance;
5. Establishing community based pastures under spate irrigation;
6. Constructing spate irrigation structure;
7. Training farmers on spate irrigation pasture management and overall small ruminant production system;
8. Establishing community based institution and providing with the required infrastructure.

### Short-term outputs

1. Goat varieties with high milk and meat production established;
2. Sheep varieties with high meat productivity established;
3. Forage production under spate irrigation system established;
4. Community based institution formed;
5. Farmers have acquired skills in animal production;
6. Farmer have acquired skills in forage production;
7. Farmers trained in milk and meat production.

### Potential long -term outcomes

1. Sustainable coping of livelihood with impacts of climate change;
2. Food insecurity and poverty reduced.

## IMPLEMENTATION

Implementation arrangement will be mainly the Ministry of Agriculture branch in Zoba Northern Red Sea, agricultural research, and other participating bodies will be the Zula communities, and local government.

### Risks and Barriers

Key risks are associated with land allocation for communities to be spate irrigated, as well as the technical capacity of the agricultural office in Zoba Northern Red Sea.



### Monitoring and Evaluation

The project design will contain monitoring and evaluation system. The responsible agency for monitoring and evaluation will be the agricultural office in Zoba Northern Red Sea and the beneficiary communities.

### Project duration

3 years starting from the time funds made available.

### COST

*USD 5,077,000*

### Cost estimates for developing and utilizing suitable sheep and goat breed types

<b>Project Component</b>	<b>Cost (USD)</b>
Breeding animals (1200 HHs @ 12 animals)	800 000
Spate irrigation structure (5 villages)	3 000 000
Earth moving machinery	400 000
Construction water point (5 wells + equipment)	150 000
Farm tools	12 000
Forage seeds (1200 ha) 4 kg/ha	240 000
Community infrastructure and training	120 000
Monitoring and evaluation	25 000
Detail strategy design	90 000
Project management	240 000
<b>Total</b>	<b>5 077 000</b>

# ERITREA

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## NAPA PRIORITY PROJECT 5

### INCREASE AGRICULTURAL PRODUCTION THROUGH SPATE IRRIGATION AND RANGE DEVELOPMENT

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#### PROJECT AREA

The Project site location is in the Northern Western Lowland, which makes part of the lower Barka River Basin, and more specifically it is in the Dighe Sub region of the Gash Barka Region involving villages situated along both side of the funeral Barka River. The area is located between Tekeret and Keru Villages. The area is hot arid featured with low and extremely variable rainfall and high drought frequency. The rangelands-rainfed cropping are highly venerable to climate variability as a sequel to this, livestock production and the populations dependant on these activities are venerable to climate variability, extreme events such as drought, and climate change. In respect to rainfall, the project area falls in the threshold or margin for rainfed-cropping; hence this activity is venerable to the impacts of climate variability and drought.

The populations in the project area consist of Tigre and Hidarbe tribes organized in about five main villages. The average household number in a village is 400, while the average household size is 5persons; while the women headed households make about 30% of the total households. Traditionally, their source of livelihood was Pastoralism; but as the pastoral system has been failing gradually to sustain their livelihood, different autonomous coping mechanisms were practiced. The most important autonomous strategy has been growing drought resistant cereal crops such as Sorghum and Pearl Millet wherever moisture is favourable including riverbeds. In this way, the communities have become agro- pastoralists for the most part. However, frequent crop failure and animal loss are destabilizing their livelihoods.

#### RATIONALE

The populations in the project area have been suffering from the low productively of the extensive livestock system, and the failure of rain-fed crop. The rangelands have been under continues human pressure, climate variability and drought, which have led in to seriously degradation and land and water use changes. Due to this, the rangeland productivity has reached its lowest point destabilizing the pastoral system. Rain-fed cropping is also failing due to climate variability and successive drought years with tendency of increased frequency and severity. The fail of the mixed crop-livestock farming system has severely impacted the livelihood of the population and their traditional coping strategies have become ineffective. This existing situation has made the farming system and the populations' dependant on it for their livelihood highly venerable to climate viability, drought and climate change.

This project is designed to adapt this vulnerable community to climate variability and drought immediately and to cope with climate change in the long term. The strategy is by intensifying the present practices of agro-pastoralism. It is expected to improve cereal food production and incomes by avoiding crop failure and low livestock productivity including death due to low and variable rainfall and drought. This will involve increase in soil moisture for cereal crop production and for feed productively

of the rangeland. Through this the livelihoods of these communities will be sustainable.

#### DESCRIPTION

##### Objectives

- Increase food crop production by avoiding crop failure due to climate variability and drought;
- Increase cash income and protein food of animal origin by avoiding direct loss of animals and poor productivity due to starvation;

##### Strategies

- Establishing spate irrigated cereal crop production system;
- Improving livestock production through improving rangeland;
- Restocking of small ruminants;
- Providing machinery and initial agricultural inputs;
- Establishing community based effective institution.

##### Activities

- Designing detail strategy and implementation plan;
- Constructing river diversion and earth embankment structures for spate irrigation;
- Providing initial seed, farm tools and machinery for construction and maintenance of spate irrigation and soil and water conservation structures;
- Construction of soil water conservation structures on rangeland;
- Reseeding of rangeland;
- Providing initial good sheep breeding stock for women headed households and the poor in general;
- Constructing water wells and equipping them for human and livestock uses;
- Training communities to manage their resources; and
- Monitoring and evaluation.

##### Short-term outputs

- Spate irrigated cereal crop production system established;
- Improved rangeland for livestock present;
- Sheep goat breeding flocks for women headed households and the poor present;
- Safe and adequate water supply system established;
- Community organization and management systems made available;
- Initial agricultural inputs present;

##### Potential long term outcomes

- Coping strategy for agro-pastoralists to climate variability, extreme weather events and climate change have been established on a sustainable bases;
- Sustainable source of livelihood for the agro-pastoralist developed;
- Lesson on adaptation strategies to climate change and climate variability have been learned to enable replication at wide scale; and
- Decreasing food insecurity/malnutrition and poverty levels.

### Implementation Arrangements

The main implementing body will be the Ministry of Agriculture through its Regional Agricultural Office in Gash-Barka Administrative Region. Other relevant stakeholders will be the target communities, local administration, the Ministry of Land, Water and Environment. The arrangement will be within the organizational structure of the stakeholder bodies.

### Risks and Barriers

- Capacity of the Ministry of Agriculture for implementation;
- Capacity to prepare detail strategy design; and
- Land tenure and use for each of the village communities for purposes of spate irrigation and rangeland development.

### Monitoring and Evaluation

The monitoring and evaluation system will be designed with the project strategy design. It should be established and implemented to ensure guidance of the project by collection information on problems and deciding on possible modification and adjustment of plan. The regional Agricultural Office in collaboration with the participating farmers will conduct the monitoring and evaluation function.

### Financial Resources

The financial contribution will be mainly from the project, however, the Ministry of Agriculture will provide extension services on crop and livestock and in the control of major animal and crop pests. The Local Administration will provide assistance in organizing the agro-pastoral communities. The target communities will provide source of labor, but mostly on cash for work.

#### COST

*USD 8,540,000*

### Table of Activities and Cost Estimates

Activities	Cost estimates (USD)
(a) Construction of Spate Irrigation Structures (at five sites)	4 200 000
(b) Initial Agricultural Inputs	300 000
(c) Construction of soil water conservation structures on rangeland (2500ha)	2 600 000
(d) Livestock breeder stock for women headed households/poor households	400 000
(e) Machinery for construction and maintenance of enhancements	600 000
(f) Community capacity building	160 000
(g) Detail Project design preparation	130 000
(h) Monitoring and Evaluation and related project management	150 000
<b>Total</b>	<b>8 540 000</b>

# ETHIOPIA

## NAPA PRIORITY PROJECT 4

### IMPROVING/ENHANCING THE RANGELAND RESOURCES MANAGEMENT PRACTICES IN THE PASTORAL AREAS OF ETHIOPIA

#### RATIONALE/JUSTIFICATION

The rangeland resources of the country are deteriorating, thus threatening the very livelihoods of the vast majority mainly the pastoral community. The major reasons for the decline in the resources bases include, among others: overgrazing, decline of the traditional mode of managing the rangeland resources, bush encroachment, introduction of Invasive Alien Species, expansion of development endeavors, population pressure, etc. These phenomena have been exacerbated by climatic change/variability and the spread of desertification. This project is believed to contribute to efforts aimed at reversing the degradation of the rangeland resources, which has been one of the main concerns in those National Regional States especially the lowlands where the pastoral communities inhabit.

#### DESCRIPTION

##### **Objectives**

To improve the current status of rangeland resources degradation by taking one woreda (district) from pastoralist areas as a pilot site from each National Regional States.

##### **Activities**

- Assessment of the socio-economic conditions of the pilot woredas;
- Introduction of fodder development initiatives such as site specific suitable fodder trees and shrubs planting program;
- Undertake controlling measures on bush encroachment problems;
- Measures to control of Invasive Alien Species such as *Prosopis Juliflora*, for instance, in Afar National Regional state;
- Document and undertake promotional activities on the indigenous rangeland resources management practices using various awareness raising approaches/ means such as media;
- Undertake adaptive research.

##### **Short-term outputs**

Improved rangeland management practices piloted in selected site

##### **Potential long-term outcomes**

Improved productivity and sustainable use of rangelands

#### IMPLEMENTATION

##### **Institutional arrangement**

Ministry of Agriculture and Rural Development (MoRAD) will lead the coordination of the project.

##### **Risks and barriers**

Lack of finance, lack of technical capacity

**Evaluation and monitoring**

A project steering committee composed of representatives from stockholders will oversee the project. Regular progress reports will be submitted to all concerned bodies by the lead institution and field visits will be conducted as appropriate. Evaluation of the project will be carried out by independent technical experts.

**COST**

Estimated (indicative and tentative) project cost

*Full project implementation: USD 2 million*

*Project design: USD 50,000*

# GAMBIA

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## NAPA PRIORITY PROJECT 3

### DIVERSIFICATION AND INTENSIFICATION OF AGRICULTURAL PRODUCTION, PROCESSING, AND MARKETING

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**Sector:** Agriculture

**Project Area:** Central River, North Bank, Upper River, Lower River, Western Regions

**Beneficiaries:** Nationwide

#### RATIONALE

Rainfed agriculture is a major source of employment and livelihood in the Gambia. Erratic rainfall patterns and increasing drought frequency are implicated in soil degradation, decline in production of traditional crops, deepening poverty and food insecurity of farming households.

#### DESCRIPTION

##### Objectives

The main objective of the project is to enhance food security, nutrition and socioeconomic livelihoods through agricultural diversification and intensification under increasing concentration of greenhouse gases in the atmosphere.

##### Specific objectives

- Increasing and diversifying agricultural productivity;
- Establishing food processing and preservation plants;
- Addressing the issue of infrastructural deficits;
- Reducing demand and supply disequilibria of traded products;
- Making agriculture a profitable economic activity.

##### Components/Activities

- Establishing irrigation schemes;
- Promoting crop diversification;
- Enhancing breeding and adoption of appropriate cultivars;
- Establishing food processing plants.

##### Inputs

- Physical infrastructure;
- Plant, equipment and machinery;
- Training resources.

##### Short Term outputs

- 14 (2 to 3 hectare size) vegetable gardens at 2 schemes per agricultural region (7);
- 60-hectare established tidal irrigated facility;
- Increased multiplication and dissemination of root crops (cassava, yam, taro, sweet potatoes), NERICA, findo and short-cycle groundnut varieties in 12 villages;
- Strengthened crop evaluation and suitable crop variety dissemination capacities of the National Agricultural Research Institute (NARI);

Reduced post-harvest losses of crops using appropriate technologies such as solar drier, cassava grater, and threshers, mills, etc.;

Strengthened and expanded outreach programme of the Food and Nutrition Unit;

Two established central fruit and vegetable processing plants.

#### Potential long term outcomes

Sustainable increased production of vegetables and household food security;

Reduced rural-urban drift;

Reduced import of food;

Promotion of yam cultivation;

Increased diversified cropping systems and extensive adoption of suitable crop varieties;

Improved nutritional standards and increased household food security and income.

### IMPLEMENTATION

#### Institutional arrangements

The Policy Focal line Department of State will be the implementing agency and the public, private and civil society agencies and institutions at central, regional and local levels will be executing agencies. The Department of State for Agriculture will be the executing agency. The National Agricultural Development Agency will lead the implementation and will work with public, private and civil society organisations and institutions at central, regional and local levels. A select number of NGO, CBO and private enterprise representatives will be co-opted into a Project Steering Committee (PSC) that reports to the National Climate Committee.

#### Risks and barriers

Multiplicity of stakeholders and the difficulties of implementing agencies to work in harmony;

Implementing agencies may have inadequate capacity to implement interventions effectively;

Delays in implementation due to bureaucratic issues or lack of financing.

#### Monitoring and Evaluation

The Project Steering Committee with its Secretariat at DWR will be responsible for the preparation of reports that will be submitted to the authorities and the NAPA Steering Committee. Mid-way into the project life, an independent consultant would evaluate project achievements and advise on improvements needed.

#### Duration

3 years

### COST

*Estimated at USD 2,710,000*

ACTIVITY	COSTS (USD)
Establishment of vegetable gardens (land dev., fence, water supply, tools, inputs)	1 040 000
Design and establish central fruit and vegetable processing plants in Brikama & Soma	1 000 000



Expand introduction/adoption of root crops, <i>NERICA</i> rice and early maturing varieties of groundnut	160 000
Strengthening/developing outreach programme of the Food and Nutrition Unit of the Department of Technical Services/NADA	90 000
Development and establishment of 60 hectares of tidal irrigated land for rice cultivation (including inputs)	270 000
<b>TOTAL</b>	<b>2 710 000</b>

# GAMBIA

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## NAPA PRIORITY PROJECT 8

### IMPROVED LIVESTOCK AND RANGELAND MANAGEMENT FOR FOOD SECURITY AND ENVIRONMENTAL SUSTAINABILITY

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**Sector:** Livestock

**Project Area:** North Bank, Lower River, and Upper River Regions

**Beneficiaries:** Farmers, Women, Community organisations, Extension services, Non-State actors (up to 41,000 participants/dependents)

#### RATIONALE

Beef and dairy cattle as well as small-ruminant production in The Gambia is predominantly based on the free-range pastoral system. Accordingly, a substantial reduction in the productivity of natural pastures due to climate factors calls for the adoption of new approaches to livestock production.

#### DESCRIPTION

##### Objectives

The overall objective is to enhance livestock-based livelihoods-to counter the threat from climate change.

##### Specific objectives

- Preserving eco-systems;
- Reducing poverty;
- Increasing livestock productivity.

##### Components/Activities

- Bushfire Control;
- Feed resources conservation;
- Improved livestock watering;
- Demarcation of rangelands/ regeneration of rangelands;
- Establishment and management of fodder tree plantation including intensive feed gardens;
- Construction of compost pens & utilisation of compost;
- Promotion of fallowing.

##### Inputs

- Technical assistance (Rangeland use expert);
- Short cycle livestock (Improved poultry stock);
- Animal feed;
- Drugs/vaccines and kits;
- Watering points;
- Animal housing (especially short cycle species);
- Fencing (Intensive feed gardens etc);
- Regular vaccination of animals.

##### Short Term outputs

- Increased awareness creation, motivation and mobilisation;

Increased productivity of poultry meat and eggs for consumption and income generation;  
 Increased soil fertility through organic fertiliser use and fallowing;  
 Improved animal health;  
 Diversified income generation and reduced poverty.

#### **Potential long term outcomes**

Food security and poverty reduction;  
 Improved nutrition of children and mothers;  
 Biodiversity conservation and reduced conflict between crop and animal farmers;  
 Genetic improvements of local livestock species;  
 Land regeneration and reclamation of marginal lands.

### **IMPLEMENTATION**

#### **Institutional arrangements**

The Executing agency will be the Department of State for Agriculture (DOSA). Implementation will be done through the National Agricultural Development Agency (NADA) who will work with public, private, and civil society organisations and institutions at central, regional and local levels. To oversee the programme, a Project Coordinating Committee should be constituted by representatives of the major stakeholders (including the Project Steering of the National Adaptation Programme of Action). This body will report to the National Climate Committee. It is recommended that full-time, autonomous project managers and staff should be appointed or deployed.

#### **Risks and barriers**

Multiplicity of stakeholders and numerous intermediary bureaucratic levels of supervision often cause delays and lack of consensus;  
 Inadequate representation of beneficiary communities/stakeholders at decision-making, management and exploitation stages may lead to poor local commitment or ownership of the projects;  
 Inadequate funding or poor disbursement procedures.

#### **Monitoring and Evaluation**

The National Agricultural Development Agency (NADA) is responsible for project monitoring, through its planning unit, the Department of Planning (DOP).

#### **Indicators**

Operational village/district land use plans;  
 Improved dry season animal feeding;  
 Increased animal productivity and health;  
 Number of farmers trained/sensitised;  
 Rangeland regeneration;  
 Increased farmer incomes from livestock-based industries.

#### **Means of verification**

Monthly project reports;  
 NADA/DOP annual reports/NASS;  
 Monthly DVS reports, annual reports;  
 National Statistics;  
 Natural resources surveys, inventories.

**Duration**

5 years

**COST**

<i>Estimated at USD 2,800,000</i>
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<b>ACTIVITY</b>	<b>COST (USD)</b>
Controlled use of fire, productivity improvement, and feed resources conservation	923 000
Improved watering	440 000
Demarcation of rangelands/ rangeland regeneration	840 000
Establishment and management of fodder tree plantation including intensive feed gardens	597 000
<b>TOTAL</b>	<b>2 800 000</b>

# GAMBIA

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## NAPA PRIORITY PROJECT 10

### INCREASING FISH PRODUCTION THROUGH AQUACULTURE AND CONSERVATION OF POST HARVEST FISHERY PRODUCTS

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**Sector:** Fisheries  
**Project Area:** Coastal and inland zones  
**Beneficiaries:** Fishing communities along the Atlantic seaboard, fish consumers in urban areas and provincial towns and villages provisioned by the artisanal fisheries sub-sector

#### RATIONALE

Local communities are currently experiencing fish supply shortage due to drought/abnormal rainfall pattern causing dessiccation of flood plains that support spawning and nursery of most freshwater fish species. Additionally, seasonal upwelling in the Gambia's coastal waters is likely to be perturbed by changes in sea surface temperature inducing the formation of thermocline leading to the confinement in the deeper layers of essential nutrients required for plankton growth. Mangrove ecosystems are also susceptible to inundation and salinity stress associated with sea-level rise. Current management practices/coping strategies fail however to adequately address sectoral challenges which consist of meeting rising demand for fish and marine products in a sustainable and profitable manner, especially in an environmental context less favourable for the renewal of resources.

In order to curb this stress, this project aims to strengthen management practices, and to increase fish productivity through aquaculture.

#### DESCRIPTION

##### **Objectives**

The main objective of the project is to make a positive contribution to poverty reduction, livelihood security, and national food security.

##### **Specific objectives**

- Optimal exploitation of resources;
- Reducing climate/weather hazards and making fisheries a profitable economic venture;
- Reducing demand and supply disequilibria of fish and fish products;
- Exploring alternative measures of fish production;
- Produce fish for rural consumption through aquaculture.

##### **Components/Activities**

- Procurement of services and supplies;
- Training of fisherfolk and processors;
- Training/sensitisation of rural communities on techniques of fish culture;
- Aquaculture.

##### **Inputs**

- Fish storage and processing infrastructure;
- Plankton sampling equipment;

Awareness creation and capacity building;  
 Aquaculture infrastructure (fish ponds);  
 Fish feed ingredients including high yielding inputs (lime, organic fertilizer, etc.);  
 Fish fingerlings (brood stock);  
 Laboratory re-agents (pond water quality).

#### **Short Term outputs**

Reduced pressure on capture fisheries;  
 Improved fresh fish quality through icing and chill storage;  
 Reduced pressure on fuelwood resources;  
 Improved fish availability and affordability;  
 Increased economic activity for rural population;  
 Increased economic activities at fish landing sites including non-fishing;  
 Related activities such as restaurants, petty trading, etc..

#### **Potential long term outcomes**

Sustainable increase of fish supply;  
 Environmental awareness and protection;  
 Improved health condition of rural communities;  
 Increased private investment in fish production through aquaculture;  
 Stability of fish prices;  
 Improved livelihoods security and personal safety at sea.

### **IMPLEMENTATION**

#### **Institutional arrangements**

A Project Management Committee (PMC) will be established to manage the project. The PMC will comprise representatives of the Department of State for Fisheries and Water Resources (DOSF&WR), the municipalities of Banjul and Kanifing and the donor community. Fishing communities in the two project locations will jointly manage the daily activities of the project. DOSF&WR with its line departments will provide technical backstopping and managerial support and weather forecasts. The PMC will report to the National Climate Committee.

#### **Risks and barriers**

Disregard for use of sea safety equipment and inappropriate interpretation of weather forecasts/warnings;  
 Slow pace of attitudinal change from traditional to conventional fishing and related activities (methods and techniques);  
 Coastal and marine pollution.

#### **Monitoring and Evaluation**

The PMC will meet on a quarterly basis and reports of the meetings will be produced. The performance of the project will be evaluated on an annual basis by an independent evaluator assisted by two persons who shall be selected by the PMC. Project performance will be assessed based on the following measurable indicators:  
 Percentage increase in fish supply (as a result of reduction in post harvest losses, increase in use of ice in fisheries, utilisation of chill/cold storage facilities);  
 Percentage reduction in fuelwood consumption for fish smoking (as a result of improved technology);

- Percentage reduction in sea accidents, loss of lives and equipment (as a result of increased use of sea safety equipment; improved awareness of importance of weather forecasts/reports);
- Percentage increase in non-fishing business activities at project sites (petty trading, restaurants etc.);
- Percentage increase in fishing economic units as well as processors, fish traders, boat builders and mechanics;
- Improved livelihoods of fisherfolk families (improved earnings, health and welfare).

**Duration**

4 years

**COST**

<i>Estimated at USD 300,000</i>
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<b>ACTIVITY</b>	<b>COST (USD)</b>
<b>Component I: Aquaculture</b>	
Baseline study of fish situation in project area prior to project implementation	5 000
Sensitization and training of communities on the techniques of fish culture	10 000
Site selection for aquaculture ponds	5 000
Construction of ponds	25 000
Fingerlings for stocking	15 000
Feed ingredients and feed formulation	10 000
Farm management including administration	25 000
High yield inputs (fertilizer, lime, etc.)	10 000
Laboratory equipment and reagents	15 000
Field visits	10 000
Protective gear	5 000
Maintenance of farm machinery (generator, pumping machine)	25 000
<b>Sub-total</b>	<b>160 000</b>
<b>Component II: Post harvest Conservation</b>	
Fish smoking houses with individual ovens	50 000
Storage facilities for processed fish (dried/smoked)	15 000
Ice making plant and chill storage facility (5-ton capacity each)	25 000
Insulated fish boxes (20 kg capacity each)	10 000
Ice boxes/containers for fresh fish storage (500 kg capacity each)	10 000
Construction of fishing canoes for fishermen training program and equipping the canoes (outboard motors, fishing nets and accessories)	10 000
Support to weather forecasting office	25 000
<b>Sub-total</b>	<b>140 000</b>
<b>TOTAL</b>	<b>300 000</b>

# GUINÉE

## NAPA PRIORITY PROJECT 8

### OPTION III: PROMOTION DES TECHNOLOGIES APPROPRIÉES EN MATIÈRE D'ADAPTATION PROJET 3-5 INTENSIFICATION DE LA CULTURE DU MIL À CHANDELLE DANS LA ZONE NORD DE LA GUINÉE

**Localisation:** Koundara, Gaoual, Mali, Siguiri, Kankan, Mandiana, Dinguiraye  
**Secteur:** Agriculture

#### JUSTIFICATION

Le nord du pays, indexé comme la zone de pauvreté extrême, est aussi la zone la plus vulnérable aux conséquences des changements climatiques qui provoqueront la disparition de certaines cultures du fait de la sécheresse. Le mil à chandelle est l'une des espèces les plus résistantes à la sécheresse, d'où la nécessité d'intensifier sa culture dans la dite zone afin d'assurer la sécurité alimentaire des populations déjà très éprouvées.

#### DESCRIPTION

##### Objectifs

##### **Global**

Promouvoir la culture des variétés résistantes à la sécheresse en vue d'assurer la sécurité alimentaire.

##### **Spécifiques**

- Informer, sensibiliser et former les producteurs;
- Vulgariser la culture du mil à chandelle.

##### Activités

- Information, sensibilisation et formation des populations;
- Identification des variétés les plus adaptées aux conditions édapho-climatiques pour augmenter le rendement;
- Amélioration des techniques culturales;
- Conservation de l'espèce par la constitution de banques de semences;
- Suivi-évaluation.

##### Résultats attendus

- Populations informées, sensibilisées et formés sur la culture du mil à chandelle;
- Populations fixées à leur terroir;
- Variétés améliorées résistantes à la sécheresse identifiées;
- Rendements augmentés;
- Suivi-évaluation assuré.

#### MISE EN OEUVRE

##### Arrangements institutionnels

Le projet sera exécuté par les communautés locales, les organisations non gouvernementales (ONG), les groupements d'intérêts et les services techniques spécialisés. La coordination sera assurée par l'unité PANA au sein du Conseil National de l'Environnement (CNE).



**Agence de mise en oeuvre**

PNUD

**Risques**

Conditions climatiques extrêmes, ennemis des cultures

**Indicateurs de suivi**

- Pourcentage des populations informées, sensibilisées et formées;
- Pourcentage d'actifs agricoles sédentarisés;
- Variétés résistantes à la sécheresse identifiées;
- Taux d'accroissement des rendements;
- Nombre de rapports de suivi-évaluation fournis

**Durée**

3 ans

**COÛT**

USD 350,000

# GUINÉE

## NAPA PRIORITY PROJECT 22

### OPTION IX: AMENAGEMENT HYDROAGRICOLE DES PLAINES ET BAS-FONDS PROJET 9-1: DÉVELOPPEMENT DE LA RIZICULTURE IRRIGUÉE EN MOYENNE ET HAUTE GUINÉE

**Localisation:** Siguiri, Koundara

**Secteur:** Agriculture

#### JUSTIFICATION

Près de 70% de la population guinéenne pratiquent une agriculture pluviale, extensive et de subsistance qui contribue à une dégradation généralisée des écosystèmes fragiles. La Haute et la Moyenne Guinée qui constituent les zones les plus pauvres du pays recèlent à elles seules plus de 75% du potentiel hydro-agricole (bas-fonds et plaines) malheureusement peu aménagé. La LPDA fait de l'aménagement des bas-fonds et des plaines une option stratégique car il contribue à réduire la pression de la riziculture pluviale itinérante sur les forêts et à l'atteinte de la sécurité alimentaire. Le développement de la riziculture irriguée dans les préfectures ciblées apporte une bonne réponse à la pénurie alimentaire liée à la sécheresse identifiée comme risque climatique majeur en Guinée.

#### DESCRIPTION

##### **Objectifs**

##### **Global**

Assurer la sécurité alimentaire des populations et atténuer les effets néfastes de l'agriculture itinérante.

##### **Spécifiques**

- Utiliser rationnellement les ressources en eau;
- Augmenter les rendements;
- Améliorer le savoir-faire des producteurs;
- Favoriser la régénération des forêts.

##### **Activités**

- Information et sensibilisation des populations;
- Identification des sites;
- Réalisation des travaux d'aménagement;
- Formation des producteurs aux techniques modernes d'irrigation et d'entretien des réseaux;
- Suivi-évaluation.

##### **Résultats attendus**

- Populations informées et sensibilisées;
- Sites hydroagricoles identifiés et aménagés;
- Producteurs formés sur les techniques d'irrigation et d'entretien des réseaux;
- Accroissement du rendement agricole;
- Suivi-évaluation assuré.

**MISE EN OEUVRE****Arrangement institutionnel**

Le projet sera exécuté par les communautés locales, les organisations non gouvernementales (ONG), les groupements d'intérêts et les services techniques spécialisés. La coordination sera assurée par l'unité PANA au sein du Conseil National de l'Environnement (CNE).

**Agence de mise en oeuvre**

PNUD

**Risques**

Conditions climatiques extrêmes, conflits domaniaux

**Indicateurs de suivi**

Pourcentage de la population informée et sensibilisée;  
Nombre de sites de production aménagés;  
Taux d'accroissement de la production agricole;  
Nombre de rapports de suivi-évaluation fournis.

**Durée**

2 ans

**COÛT**

*USD 300 000*

# GUINÉE

## NAPA PRIORITY PROJECT 23

### OPTION X: PROMOTION D'ACTIVITES GENERATRICES DE REVENUS PROJET 10- 1: PROMOTION DE L'ÉLEVAGE DES PETITS RUMINANTS

**Localisation:** Siguiri, Kouroussa, Mali, Koundara, Beyla

**Secteur:** Agriculture

#### JUSTIFICATION

Il ressort de l'étude d'identification des ressources et groupes socio-économiques vulnérables qu'après les agriculteurs, les éleveurs sont les plus exposés. Les variabilité/changements climatiques réduiront la production et la productivité du cheptel. Elles occasionneront la raréfaction des espèces fourragères, la disparition des zones de pâturage, l'augmentation de la transhumance et la prolifération des maladies épisodiques. Le gros bétail, notamment les bovins qui assurent en grande partie l'approvisionnement des populations en protéines animales sont les plus exposés. Par contre, les ovins et les caprins, traditionnellement élevés en Guinée sont, selon la même étude, les moins vulnérables. L'intensification de leur élevage contribuera efficacement à l'approvisionnement des communautés en lait, viande et cuir. Elle peut aussi assurer aux éleveurs une importante source de revenus. Les fumiers de ces petits ruminants constituent un précieux engrais organique.

#### DESCRIPTION

##### Objectifs

##### **Global**

Accroître les revenus des populations, contribuer à la sécurité alimentaire et réduire la pression sur les ressources naturelles

##### **Spécifiques**

- Renforcer les capacités des groupements d'éleveurs de petits ruminants;
- Créer des unités d'élevage semi-intensif de caprins et ovins.

##### Activités

- Information et sensibilisation les groupes cibles;
- Organisation et formation des éleveurs (groupements d'éleveurs);
- Réalisation d'infrastructures d'élevage;
- Acquisition des sujets et suivi prophylactique;
- Organisation de la filière de commercialisation;
- Mise en place de parcelles fourragères;
- Suivi-évaluation.

##### Résultats attendus

- Populations cibles informées et sensibilisées;
- Éleveurs organisés et formés;
- Meilleurs sujets sélectionnés;
- Santé animale améliorée;
- Infrastructures d'élevage réalisées;
- Filière de commercialisation mise en place;
- Productivité des petits ruminants augmentée;

Problèmes liés à l'alimentation des petits ruminants en saison sèche résolus;  
Revenu des éleveurs augmenté.

**MISE EN OEUVRE**

**Arrangement institutionnel**

Le projet sera exécuté par les communautés locales, les organisations non gouvernementales (ONG), les groupements d'intérêts et les services techniques spécialisés. La coordination sera assurée par l'unité PANA au sein du Conseil National de l'Environnement (CNE).

**Agence d'exécution**

PNUD

**Risques**

Epidémies, Conditions climatiques extrêmes

**Indicateurs de suivi**

Pourcentage de populations rurales sensibilisées;  
Taux d'accroissement des effectifs des petits ruminants;  
Nombre et capacité des infrastructures d'élevage réalisées;  
Taux de vaccination;  
Superficies (ha) de cultures fourragères aménagées;  
Taux d'accroissement des revenus;  
Nombre de rapports de suivi-évaluation fournis.

**Durée**

4 ans

**COÛT**

*USD 325 000*

# GUINÉE

## NAPA PRIORITY PROJECT 24

### OPTION X: PROMOTION D'ACTIVITES GENERATRICES DE REVENUS PROJET 10-2: PROMOTION DES CULTURES MARAÎCHÈRES

**Localisation:** Kouroussa, Koundara, Lola, Mali

**Secteur:** Agriculture

#### JUSTIFICATION

Le secteur agricole est l'une des priorités nationales qui répond au besoin de réduction de la pauvreté dans les zones rurales, caractérisées par une faiblesse des investissements et la persistance des pratiques traditionnelles (pluvial et extensif). Les agriculteurs représentant près de 70% de la population constituent la couche la plus pauvre. Ils sont exposés à une baisse de production et de productivité des sols due aux perturbations du régime pluviométrique. En Guinée le maraîchage est principalement pratiqué par les femmes qui sont confrontées à des difficultés comme le manque d'eau, d'intrants agricoles, de semence améliorée et d'équipements appropriés. La promotion des pratiques de cultures de contre saison notamment le maraîchage contribuerait efficacement à l'augmentation de leurs revenus et à leur sécurité alimentaire. En effet, selon les études de vulnérabilités aux changements climatiques, les cultures maraîchères sont moins vulnérables à la sécheresse et à la forte insolation que la plupart des cultures vivrières (riz, maïs, fonio, etc.).

#### DESCRIPTION

##### Objectifs

##### **Global**

Améliorer les revenus des groupes cibles et contribuer à la sécurité alimentaire

##### **Spécifiques**

- Aménager 150 hectares de cultures maraîchères;
- Former les groupes cibles aux techniques culturales non saisonnières;
- Accroître la production et la productivité agricole;
- Contribuer à l'émergence de petites unités de conservation et de transformation;
- Améliorer le circuit de commercialisation des produits.

##### Activités

- Information et sensibilisation des groupes cibles;
- Organisation et formation des groupements maraîchers;
- Aménagement des périmètres maraîchers;
- Organisation de la production, de la transformation et de la commercialisation des produits maraîchers;
- Suivi et évaluation

##### Résultats attendus

- Populations cibles informées et sensibilisées;
- Groupements maraîchers organisés et formés;
- Filières de production, de conservation, de transformation et de commercialisation mises en place;
- Revenus des maraîchers augmentés;

Suivi-évaluation réalisé.

**MISE EN OEUVRE**

**Arrangement institutionnel**

Le projet sera exécuté par les communautés locales, les organisations non gouvernementales (ONG), les groupements d'intérêts et les services techniques spécialisés. La coordination sera assurée par l'unité PANA au sein du Conseil National de l'Environnement (CNE).

**Risques**

Conflits domaniaux;  
Invasion acrédiennne;  
Facteurs climatiques extrêmes.

**Indicateurs de suivi**

Pourcentage des populations cibles informées et sensibilisées;  
Nombre de groupements maraîchers organisés et formés;  
Superficies mises en valeur;  
Quantité de produits conservés, transformés et commercialisés;  
Taux d'accroissement du revenu des maraîchers;  
Nombre et qualité des Nombre de rapports de suivi-évaluation fournis.

**Durée**

3 ans

**COÛT**

<i>USD 250,000</i>
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# GUINÉE

## NAPA PRIORITY PROJECT 25

### OPTION X: PROMOTION D'ACTIVITES GENERATRICES DE REVENUS PROJET 10- 3: CRÉATION DE RANCS D'AULACODES EN VUE DE LA RÉDUCTION DES FEUX DE BROUSSE ET L'AMÉLIORATION DES CONDITIONS DE VIE DES POPULATIONS RURALES

**Localisation:** Kérouané, Kankan, Beyla, Lola et Guéckédou

**Secteur:** Agriculture et Elevage

#### JUSTIFICATION

Le gibier est la principale source de protéine animale pour les populations rurales. Malheureusement, suite aux activités anthropiques néfastes (déboisement, feux de brousse, braconnages, etc.), on assiste à sa raréfaction. L'aulacode est l'une des ressources les plus prisées dont la chasse est à l'origine des feux de brousse qui accentuent le processus de dégradation des terres et l'émission des gaz à effet de serre. La promotion de l'aulacodiculture contribuera à la sécurité alimentaire, à la protection de l'environnement et à l'augmentation des revenus des populations cibles.

#### DESCRIPTION

##### **Objectifs**

##### **Global**

Contribuer à l'amélioration des conditions de vie des populations et à la préservation de l'environnement.

##### **Spécifiques**

- Créer des unités d'élevage d'aulacodes;
- Générer des revenus;
- Limiter les feux de brousse.

##### **Activités**

- Information et sensibilisation les groupes cibles;
- Organisation et formation des éleveurs (groupements d'éleveurs);
- Appui à la création 10 ranchs;
- Acquisition des sujets et suivi sanitaire;
- Appui à l'organisation de la filière de commercialisation;
- Mise en place de parcelles fourragères;
- Suivi-évaluation.

##### **Résultats attendus**

- Populations cibles informées et sensibilisées;
- Éleveurs organisés et formés;
- Sujets sélectionnés mis à disposition des éleveurs;
- Suivi sanitaire assuré;
- 10 ranchs créés;
- Filière de commercialisation mise en place;
- Parcelles fourragères mises en place
- Revenu des éleveurs augmenté;
- Suivi-évaluation assuré.



**MISE EN OEUVRE****Arrangement institutionnel**

Le projet sera exécuté par les communautés locales, les organisations non gouvernementales (ONG), les groupements d'intérêts et les services techniques spécialisés. La coordination sera assurée par l'unité PANA au sein du Conseil National de l'Environnement (CNE).

**Agence d'exécution**

PNUD

**Risques**

Epidémies, Conditions climatiques extrêmes

**Indicateurs de suivi**

Nombre de personnes informées sensibilisées et formées;  
Nombre et capacité des infrastructures d'élevage réalisées;  
Nombre de têtes élevées;  
Nombre de sujets vendus;  
Superficies (ha) de cultures fourragères aménagées;  
Taux d'accroissement des revenus;  
Nombre de rapports de suivi-évaluation fournis.

**Durée**

3 ans

**COÛT**

*USD 300,000*

# GUINEA BISSAU

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## NAPA PRIORITY PROJECT 1

### SUPPORT TO THE DIVERSIFICATION OF PRODUCTION AND FOOD DIET PROJECT.

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**Location:** Quinara and Tombali regions

#### JUSTIFICATION

Rice is the country's main food crop. It is produced both in the mangrove production system and in small valleys and uplands.

Despite being the country's main food crop local production can only meet 50%-55 % of national needs. The difference between supply and demand is covered by importations. The mangrove rice's production system (the country's main type) has been steeply degrading lately due to structural and occasional problems. The downward trend seen on rainfall patterns coupled with a rise in river waters' levels, thus leading to penetration of rice fields by salt water and their consequent destruction, tends to worsen. The 2005/2006 harvest may be quoted as an example to illustrate this point. Production in the south of the country was almost totally lost. This is was a very critical situation indeed but it also helped to awaken mangrove-rice growers (one-crop farmers) for the need to diversify production. The food shortage that set in led farmers to seek for alternatives themselves and we can see them currently growing cassava, sweet potato and yam. Despite being at a very reduced scale due to the insufficiency of vegetation material, it is already an initiative that may be utilised to launch a broad programme to diversify production as an alternative for cases of insufficient rain bearing in mind that the initiative and interest came from the farmers themselves. The project thus appears as a relief to the food insecurity problem caused by lack of rain or water penetration of mangrove-rice fields.

Project actions (production, processing and commercialisation) will be designed in such a way that beneficiaries will be responsible for their execution, and actions will have continuity after the project's completion.

#### DESCRIPTION

##### Global objective

Increase in food security

##### Specific objectives

To foster the diversifying of production and consumption of foodstuff in the Quinará and Tombali regions.

##### Components

- Production, processing and commercialisation of cereals;
- Production, processing and commercialisation of fruit and vegetables;
- Food and nutrition.

##### Expected results

- A diversified consumption of local produce Production of vegetables in adequate quantity and quality;

- Populations become accustomed to consume a diversified mix of local produce with higher nutritional value;
- Lower risk of food insecurity malnutrition;
- Increase in households' incomes through the commercialisation of surplus production.

**Beneficiaries**

Rural communities.

**IMPLEMENTATION****Institutional Implementation Framework**

Ministry of Agriculture and Rural Development, DGA, DSER, Directorate of Producers' Service Support, Ministry of Public Health.

**Monitoring and Evaluation**

To be ensured by DGA, GAPLA, Directorate General of Environment and CAIA.

**Risks and Barriers**

There are no risks and barriers that may jeopardise the project's implementation.

**Project duration**

3 years.

**COST**

*USD 600,000*

# GUINEA BISSAU

## NAPA PRIORITY PROJECT 13

### SUPPORT TO PRODUCTION OF SHORT-CYCLE ANIMALS PROJECT

**Location:** Nationwide

#### JUSTIFICATION

The short-cycle-animals' raising project should be seen as a food security strategy designed for rural and semi-urban communities. Climate changes lead to uncertainty in the production of vegetal foodstuffs and that calls for the seeking of other alternative sources of food, e.g., animal protein to feed our population. Guinea-Bissau has an enormous potential in grazing land plus a population well experimented in raising animals, assets that need to be optimised. Short-cycle livestock is a quick source of income, especially for women that may draw great benefits from it and hence improve their families' living conditions, thus contributing to poverty relief in the rural world. This project aims at augmenting production of meat and animal proteins, and enhancing fishing and agricultural sub-products for animal feeding culminating in an improvement in rural populations' living conditions.

#### DESCRIPTION

##### **Global objective**

To increase food security.

##### **Specific objectives**

To increase production and consumption of animal food items (meat, milk, eggs, etc.).

##### **Components**

- Production modernization;
- Animal health;
- Institutional support;
- Training and fitting;

##### **Expected results**

- 10 pilot units for training and demonstration nationwide are set up;
- Consumption of meat, milk, eggs and other produce from animal sources increases nationwide;
- Higher household incomes;

##### **Beneficiaries**

Animal raisers, NGOs, population and farmers' organisations;

#### IMPLEMENTATION

##### **Institutional Implementation Framework**

Ministry of Agriculture and Rural Development (MADR) and Directorate General of Livestock (DGP).

##### **Monitoring and Evaluation**

Monitoring and evaluation will be placed under DGP, GAPLA, Directorate General of Environment, Environmental Impact Evaluation Unit.

**Risks and Barriers**

Lack of a master plan for livestock development

Non-approval by parliament of regulations governing the implementation of the Land Law.

**Duration**

2 years.

**COST**

*USD 400,000 (Two hundred thousand dollars)*

# HAÏTI

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## NAPA PRIORITY PROJECT 012

### APPUI AU RENFORCEMENT DE LA PRODUCTION AGRICOLE À JEAN-RABEL

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**Localisation:** Jean Rabel (Nord-Ouest)

**Secteur:** Agriculture

**Option dominante:** Préservation et renforcement de la sécurité alimentaire (Option 4)

**Durée:** 2 ans

#### JUSTIFICATION

À l'aube du XXI<sup>e</sup> siècle, le département du Nord-Ouest reste encore l'un des pôles du pays où la famine ne cesse de se manifester en Haïti. Les activités agricoles ne parviennent pas à satisfaire les besoins de la population. Cette situation peut être expliquée en raison du faible pourcentage de plaines disponibles ou sous exploitées, de la perte de la fertilité des montagnes due à l'érosion et des conditions climatiques difficiles. Le manque de capital et les problèmes phytosanitaires restent des contraintes majeures actuelles à l'avancement de l'agriculture de la région. Les habitants s'adonnent aux activités les plus faciles, voire la coupe des arbres pour la production de charbon de feu. Entreprendre des activités visant à renforcer la production agricole s'avère nécessaire en vue de résoudre des problèmes de sécurité alimentaire graves à Jean-Rabel.

#### DESCRIPTION

##### Objectifs

- Mettre en place une boutique d'intrants en vue de répondre aux besoins agricoles les plus urgents;
- Vulgariser les techniques agricoles les plus élémentaires répondant aux caractéristiques du milieu;
- Mettre à la disposition des exploitants agricoles un fonds de crédit agricole.

##### Activités

- Formation des agriculteurs et vulgarisation des principes d'agriculture durable et conservationniste;
- Expérimentation et démonstration de nouvelles techniques de cultures et de conservation des produits;
- Distribution d'outils aratoires aux organisations (lot de 11 outils environ), 100 outils par type;
- Construction de silos dans chacune des sections communales de Jean-Rabel en vue de la conservation des produits agricoles (maïs, mil, pois de souche, pois congo, ricin, etc...), pour les périodes difficiles;
- Formation sur les techniques de gestion financière et organisationnelle;
- Mise en place de la boutique d'intrants;
- Recrutement et Installation du comité de gestion de la boutique et du fonds d'assistance financière.

##### Intrants

- Ressources humaines locales et externes;

- Ressources financières;
- Appui des organisations locales;
- Intrants agricoles (semences d'espèces résistantes à la sécheresse).

#### Extrants à court terme

- De silos sont construits à travers toute la commune;
- Les agriculteurs maîtrisent les techniques de préparation d'engrais organiques (traitement des déchets organiques en vue de la fabrication du compost) et de l'agriculture conservationniste;
- Des organisations ou associations d'agriculteurs sont approvisionnées en semence (haricot, pois congo, pois de souche, maïs, mil, ricin);
- Un fonds de crédit agricole fonctionne;
- Un comité de gestion de la boutique et du fonds d'assistance financière installé.

#### Résultats potentiels à long terme

- Augmentation très marquée de la production agricole;
- Amélioration de la sécurité alimentaire;
- Diminution de la pression sur les ressources ligneuses;
- Amélioration des conditions environnementales;
- Renforcement organisationnel.

#### MISE EN OEUVRE

#### Risques et obstacles

Le renforcement de l'aide alimentaire entreprise par certaines organisations peut influencer négativement le déroulement du projet.

#### RESSOURCES FINANCIÈRES

Le coût prévisionnel du projet est de:

*USD 417,353.00*

	Cash (USD)	Nature
1- Coût Total Projet	417 353	
2- GEF	250 411	
3- Co-financement / Partenaires potentiels	125 000	
Gvt. Haïtien / MDE/PIP		25 000
Fonds Assistance Économique et Social		
Participation communautaire		16 942
ONG local		

# KIRIBATI

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## NAPA PRIORITY PROJECT 6

### KIRIBATI NAPA SECTION 6.2.7

#### AGRICULTURAL FOOD CROPS DEVELOPMENT

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##### RATIONALE

Food crop production is known to be critically dependent on the quality and quantity of soil moisture and ground water. Seasonal variability of precipitation, prolonged droughts, more efficient evaporation-transpiration, and occasional seawater over-wash have localized serious impacts on crop production and threatened the very livelihood of the people. These impacts are expected to intensify according to climate change scenarios. The scenarios expect precipitation to increase but variability of precipitation is not featured or accounted for. Furthermore, sea level rise will most likely lead to land erosion, thus decreasing land surface area for storage of water and tree crops.

Food crop production during water stressed conditions is minimal as ground water lenses get dry or turn brackish. These combined impacts on the livelihood of the people would have shortened their life, caused malnutrition particularly among children, and led to greater exertion on the adults in the toil of subsistence lifestyle.

The consumption and production of food crops have declined in recent years. Causes of such decline possibly include urban migration, decreasing size of land for agricultural production, and climate related disasters and seasonal precipitation variability.

##### DESCRIPTION

###### **Objectives**

- To maintain main existing gene banks;
- To increase and diversify food crop production throughout Kiribati;
- To make more people attracted to, see economic opportunities in, and engaged in varieties of agricultural systems;
- To increase efforts at planning out and meeting support requirements for agricultural activities throughout the islands.

###### **Activities**

NAPA agricultural activities will be carried out on outer islands and at the headquarters. All activities will be coordinated by the Agricultural Division. Visits to outer islands by a coordinating body at the headquarters, and of field agricultural staff on outer islands to the headquarters will keep the momentum of the activities on going once they are started. This strategy will mitigate the effect on the activities of staff isolation and any tendency to fall into the norm and style of outer island timelessness lifestyle.

Various compost systems for proven cultivatable vegetables and tree crops will be set up and demonstrated for farmers at outer island nurseries. To encourage composite-based farming for home consumption, simple tools will be purchased and disseminated to farmers at prices affordable to them.



Food processing and marketing and new initiatives in these areas will be facilitated and promoted through training in various food processing methods, and in an organized agricultural show.

Gene banks for agricultural crops and other planting materials, particularly for those that are becoming rare, will be maintained at the Headquarters gardens and at each of the outer islands. The gene banks will supply planting materials on outer islands.

#### Outputs

- Feeling of professional isolation by agricultural field officers on outer islands is reduced, and sense of team work among key players is developed.
- More people and households will be engaged in agricultural activities for traditional food crops and new cash crops.
- Planting materials are readily available at the island's nurseries and regularly supplied where necessary from the gene banks located and managed at the Agricultural Headquarters and other growth centres.
- The number of agricultural tools on outer islands will increase.
- Accessibility to nutritional food crops will increase and cash income on outer islands from agricultural produce will increase.

#### COST

*AUD 1,555,230 (+10% contingency cost)*

<b>Indicative costs (AUD)</b>	<b>Local annual budget (AUD)</b>	<b>Total NAPA Costs Over 3 yrs</b>	<b>Responsible Ministry</b>
450 000	1 105 230	1 555 230	MELAD

# LESOTHO

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## NAPA PRIORITY PROJECT 1

### IMPROVE RESILIENCE OF LIVESTOCK PRODUCTION SYSTEMS UNDER EXTREME CLIMATIC CONDITIONS IN VARIOUS LIVELIHOOD ZONES IN LESOTHO

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#### RATIONALE

Livestock production is one of the most important components of the farming systems throughout all livelihood zones of Lesotho. It provides a major source of cash income, food (milk and meat), draught power, and transport. Livestock is also an important reserve of wealth and security.

For all its importance, livestock farming has been in steady decline both in number and quality over the years. This decline can be ascribed to recurring prolonged droughts which have resulted in the deterioration of rangelands and their carrying capacity. This project would be an intervention to revamp livestock farming in Lesotho, and thus provide a viable option for the people to adapt to the changing climate.

Livestock production in Lesotho is divided among four major economic enterprises, including:

#### **1. Sheep & Goats for wool and mohair production**

Wool and mohair production are the mainstay of the production systems and livelihoods in the mountain districts of Lesotho. The mountain livelihood zone form the largest single block of land (1,444,667 ha) upon which livestock with particular emphasis on sheep and goats production are the basis for people's livelihoods. The production of wool and mohair is dependent on resilience and quality of range management systems and veterinary programmes. These parameters are affected directly by climate change particularly of extreme drought and temperature dynamics. Drought affects the quality and resilience of the rangelands while extreme temperatures particularly those leading to drought affect disease incidence and require good veterinary services.

Sheep and goats production currently support other forms of income streams like the sale of skins as by products of meat production. Small scale industries in the lowlands of Lesotho depend on good quality skins for production of various products such as shoes and sandals.

The production of meat and milk in the mountain districts is mainly for home consumption and subsistence purposes. For example statistics show that on average 6000 sheep, 2500 goats and 750 cattle are slaughtered annually at household levels in the mountain districts. Overall the mountains accounts for about 54 and 45 percent respectively of the total sheep and goats slaughtered in Lesotho annually.

#### **2. Dairy production**

A total of 290 farmers in the lowlands and foothills rear improved dairy cows for milk production, using Friesians, Jerseys and Brown Swiss cows. The milk is processed and sold through a series of private and parastatal milk collection centres. While farmers generally rely on communal rangelands for grazing and feeding of dairy cattle, the commercial sector on dairy relies on stall feeding and zero grazing. In

general fodder production is a priority issue for all dairy producers especially in the light of deteriorating state of the rangelands.

#### DESCRIPTION

##### Objectives and Activities

	Objective	Activity
1. Wool and mohair	To stabilize wool and mohair production systems against climate change in the mountain zone livelihood systems.	Upgrade veterinary services; Build capacity of grazing associations; Implement livestock reduction strategies; Establish fodder production schemes; Establish wool and mohair processing centres.
2. Dairy production	To improve the state of dairy enterprises in the lowlands and foothills livelihood communities.	Upgrade veterinary services Establish fodder production Establish supplementary feeding industries Improve milk collection centres Establish milk processing and cottage industries

##### Inputs

Technical expertise in the various activities  
Financial resources

##### Short-Term Outputs

Improved sustainable livestock enterprises  
Improved production of livestock and livestock products  
A more diversified livestock based income streams

##### Potential Long-Term Outcomes

The long-term outcome of the project will be an improved and more diversified livestock rearing in Lesotho.

#### IMPLEMENTATION

##### Institutional Arrangement

The project will be implemented by the Department of Livestock Services, working in collaboration with other relevant government departments and community organizations.

##### Risks and Barriers

Potential risks and barriers to the success of the project are:

- Inadequate support and involvement of relevant stakeholders
- Insufficient financial resources

### Evaluation and Monitoring

Monitoring committees will work in close collaboration with the Department of Livestock Services and the Ministry of Local Government. Monitoring and evaluation will be done on regular basis.

#### COST

*Estimated at USD 3,210,000*

<b>ACTIVITY</b>	<b>COST (USD)</b>
Build capacity of grazing associations	275 000
Implement livestock reduction strategies	115 000
Establish fodder production schemes	150 000
Upgrade wool and mohair processing centres	300 000
Establish supplementary feeding industries	220 000
Promote dairy industry	280 000
Establish milk collection centres, milk processing and cottage industries	300 000
Promoting Improved housing of livestock	250 000
Promoting Feed Production and supply channels	210 000
Organize community marketing structures	240 000
Upgrade veterinary services	340 000
Build Capacity and skills on livestock development	320 000
<b>Grand Total</b>	<b>2 980 000</b>

# LESOTHO

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## NAPA PRIORITY PROJECT 2

### IMPROVEMENT OF CROP PRODUCTION SYSTEMS TO REDUCE FOOD INSECURITY IN THE LOWLANDS OF LESOTHO

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#### RATIONALE

Crop production is one of the most important components of the farming systems throughout all livelihood zones of Lesotho. Approximately 9 to 12 percent of the total land area of Lesotho is used for arable crop production 90 percent of which is dryland farming and approximately 10 percent falling under irrigated conditions. Arable agriculture employs more people than any other sector in Lesotho and provides principal means of livelihoods for about 90 percent of the country's rural population. While 55 percent of the population is landless, arable agriculture contributes about 10 percent to the national GDP (Chakela 1997). The cropping sector is dominated by smallholder farmers struggling to meet their subsistence requirements from year to year.

The main cropping region is the north and south western lowlands and the Senqu River Valley, although significant cropping does occur on the sloping land in the foothills and mountains. The south western lowlands are in particular susceptible to erratic agroclimatic conditions especially annual rainfall patterns. The amount and distribution of precipitation is an important factor in the success or failure of crop production endeavors. However, under the climate change water conservation and water saving irrigation technologies would significantly stabilize and improve current livelihoods based on dryland and irrigated agriculture.

Drought, frost, snow and hail pose significant risks for agricultural production in Lesotho. Rainfall occurs mainly during the summer season but is extremely variable in quantity and timing. The lowlands areas are significantly drier and crop failure from drought is very common. Rainfall is higher in the mountains and foothills but the cropping season is much shorter due to the early onset of frost which will be exacerbated by climate change.

The domestic production of fruits and vegetables is a source of livelihood for at least 10 percent of the population in the foothills, lowlands and Senqu River Valley. Current development initiatives are exploiting the country's potential to increase the yields of fruits trees. However, this potential has been marginalized by skewed climate extremes and hazards such as: hail, frost, and extreme temperatures. These climate hazards are projected to be more severe under climate change conditions.

Crop production in Lesotho is divided among three major economic cropping systems:

- 1. Cereal Crop Production: Promotion of conservation agriculture technologies and drought resistant crop varieties to support dryland farming in the Lowlands and Senqu River Valley.**

The principal dryland crops in Lesotho are maize and sorghum which account for about 80 percent of the planted area followed by wheat (12 %) and bean /peas (7 %). Maize and sorghum are primarily cultivated for household subsistence, while wheat, beans, peas are grown mainly for cash crops. Minor dryland crops include sunflower, lentils and fodder crops.

The most significant manifestation of climate change in Lesotho is chronic drought and diminishing rainfall. Surviving periods of drought is now the biggest challenge for farmers. One of the most effective strategies for adapting to the changing climatic conditions is development and promotion of crop strains that can withstand drought. This project aims to support and facilitate the development and widespread use of drought-resistant crops and use of conservation agriculture technologies.

## **2. Horticulture and Fruit Production: Improve Production of Fruits and Vegetables in the Lowlands and Foothills**

The foothills and lowlands of Lesotho are major fruit production areas. There are about 34 seedling nursery facilities installed in the southern districts which supply seedlings to farmers country wide. A total of 74 farmers are involved in seedling production to support horticultural farming. However, these nurseries have of late not been able to meet the country's domestic seedling needs as their production is curtailed by extreme climatic events mainly hail, frost and temperature borne diseases. As a coping strategy farmers have installed plastic insulation sheets nurseries to minimize climatic hazards on their produce. However, occurrences of severe thunderstorms associated with hail often destroy these facilities. Due to poor insulation of these facilities frost kill temperatures associated with cold front surges often destroy the seedlings. It has been projected that cold fronts will be more frequent and more severe under climate change conditions.

## **3. Irrigation Farming Systems: Promotion of Water Conserving Irrigation Systems in the South-western Lowlands and Senqu River Valley.**

The lowest annual precipitation (450 mm) in Lesotho occurs in the Senqu River Valley and peaks at 700 mm in the south and western lowlands compared to highs of 1,000mm in the northern lowlands and eastern highlands. Lesotho's precipitation is characterized by fluctuating trends, with high variability from year to year. The occurrence of summer rainfall is an important factor in rainfed subsistence crop production in Lesotho. Furthermore, the topographical and climatic variations impose severe constraints on crop production.

The largely subsistence farming systems in these areas is heavily reliant upon rainfall. Irrigations systems have also been adopted by an increasing number of farmers who grow vegetables for commercial purposes. Most irrigation systems are supported by water collection dams from which sprinkler irrigation systems powered by small to medium engines are used. In the Senqu Valley and foothills areas of the southern lowlands, irrigation systems are powered by gravity.

The advent of climate change has brought about considerable uncertainty and curtailment of farming due to frequent drought occurrences. This has had a severely negative impact on the livelihoods and food security – especially for rural communities in the southern lowlands and Senqu River Valley. To adapt to the changing climatic conditions, the farming communities in these area have to reduce their reliance on rainfall. This can be achieved by promoting water conservation strategies and water-saving irrigation systems like drip irrigation as well as energy efficient systems like the gravity driven sprinkler systems into the farming operations.

DESCRIPTION

## Objectives and Activities

	Objective	Activity
<b>1. Promotion of conservation agriculture technologies and drought resistant crop varieties to support dryland farming in the Lowlands and Senqu River Valley</b>	Multiplication of drought-resistant strains of various crops;	Promote local generation of drought-resistant cereal and crop varieties;
	Facilitation of availability and accessibility of drought resistant strains to farmers;	Development of distribution channels for drought resistant and short season seeds throughout the farming community;
	Promotion of moisture-conserving practices among farmers.	Promote water conserving practices among farmers.
<b>2. Improve Horticultural Production: Fruits and Vegetables in the Lowlands and Foothills</b>	To revive and strengthen irrigated commercial and domestic horticulture in the lowlands and foothills;	<ul style="list-style-type: none"> <li>a. Development of vegetable and fruit tree gardens;</li> <li>b. Expansion of production of high value cash crops such as asparagus;</li> <li>c. Development of local produce marketing and distribution channels.</li> </ul>
	To develop robust horticultural seedling nurseries whose production will be less affected by climate variability and change.	<ul style="list-style-type: none"> <li>a. Establishment of nurseries of both indigenous and exotic vegetables and fruit trees</li> <li>b. Provision of quality seedlings to horticultural farmers</li> <li>c. Development of local produce marketing and distribution channels</li> <li>d. Expansion of floricultural sector for domestic and export supplies</li> </ul>

<b>3. Promotion of Water Conserving Irrigation Systems in the Southwestern Lowlands and Senqu River Valley.</b>	To build the capacity and skills /knowledge base of rural farmers in management and operation of irrigation methods/techniques.	a. Training communities on irrigation methods and techniques. b. Creating irrigation farming blocks for cost sharing c. Building small dams and other storage facilities
	To promote adoption and use of water saving irrigation methods and technologies.	Acquisition and maintenance of equipment for trip irrigation systems. Training farmers in the management of trip irrigation systems. Extension services to support irrigation farmers and schemes.
	To promote conservation agriculture: zero and minimum tillage systems for soil water conservation.	a. Training farmers in the use of manual conservation agriculture methods. b. Acquisition of conservation agriculture equipment and implements

#### Inputs

Technical expertise in the various activities  
 Financial resources

#### Short-Term Outputs

Enhanced awareness and appreciation of low cost drip irrigation techniques and technologies in rural communities in the lowlands regions  
 Increased accessibility of low cost drip irrigation equipment to farmers  
 Improved and sustainable crop production  
 An expanding domestic production of fruits and vegetables in Lesotho  
 Increased and stable yields of drought resistant crop varieties  
 Conservation agriculture widely adopted

#### Potential Long-Term Outputs

Potential long-term outputs of the project are:

Contribution to national food security and poverty reduction in the target areas  
 Capacity building and skills development for use of irrigation technologies  
 Improved management of village plantations  
 Strong horticultural industry in Lesotho  
 Mainstream use of crop resistant varieties



## IMPLEMENTATION

### **Institutional Arrangement**

The Ministry of Agriculture and Food Security in close collaboration other the Ministry of Local Government, NGOs and local communities will coordinate and implement this project.

### **Risks and Barriers**

- Inadequate support and involvement of communities and farmers
- Insufficient financial resources

### **Evaluation and Monitoring**

Village monitoring committees will work in close collaboration with Ministry of Agriculture and Food Security with Research Institutions. Monitoring and evaluation will be done on regular basis. The coordinating ministry will prepare quarterly progress and financial reports to the international funding agency during the implementation of the project.

## COST

*Estimated cost USD 4,235,000*

<b>Activity</b>	<b>COSTS (USD)</b>
Training communities on irrigation methods and techniques	150 000
Creating irrigation farming blocks for cost sharing	200 000
Building small dams and other storage facilities	250 000
Acquisition and maintenance of equipment for trip irrigation systems	300 000
Training farmers in the management of trip irrigation systems	180 000
Extension services to support irrigation farmers and schemes	225 000
Training farmers in the use of manual conservation agriculture methods	220 000
Acquisition of conservation agriculture equipment and implements	215 000
Development of vegetable and fruit tree gardens	140 000
Expansion of production of high value cash crops such as asparagus	275 000
Development of local produce marketing and distribution channels	240 000
Establishment of nurseries of both indigenous and exotic vegetables and fruit trees	250 000
Provision of quality seedlings to horticultural farmers	125 000
Development of local produce marketing and distribution channels	150 000
Expansion of floricultural sector for domestic and export supplies	250 000
Promote local generation of drought-resistant cereal and crop varieties	175 000
Development of distribution channels for drought resistant and short season seeds throughout the farming community	150 000
Promote water conserving practices among farmers	120 000
Promote local generation of drought-resistant cereal and crop varieties	175 000
Development of distribution channels for drought resistant and short season seeds throughout the farming community	150 000
Promote water conserving practices among farmers	120 000

Promote local generation of drought-resistant cereal and crop varieties	175 000
<b>GRAND TOTAL</b>	<b>4 235 000</b>

# LESOTHO

## NAPA PRIORITY PROJECT 8

### IMPROVEMENT OF COMMUNITY FOOD SECURITY THROUGH THE PROMOTION OF FOOD PROCESSING AND PRESERVATION TECHNOLOGIES

#### RATIONALE

Recurring drought and irregular rainfall patterns have had the effect of fluctuating levels of agricultural production, with relatively high yield in some years and meagre output in others. These conditions will be more pronounced under climate change. It is for this reason that there is a pressing need to enhance the capacity of farmers to preserve their produce during years of abundance, to be able to save for years of scarcity.

Moreover, the lack of capacity to process and preserve the produce has meant that the rural communities have food security for a limited period following harvest. Food processing and preservation will extend the period of high food security following harvest in the winter including preservation of summer production of vegetables and fruits.

#### DESCRIPTION

##### Objectives and Activities

Objective	Activity
To enhance availability and accessibility of food processing and preserving technologies	Promote growth of food preservation and processing industry
Reinforcement of commercialisation in agricultural products	Promote development of appropriate technologies for food preservation (e.g. driers, canneries etc.)

##### Inputs

- Technical expertise in the development, production and running of appropriate food processing/preserving technologies
- Financial resource

##### Short-Term Outputs

- An expanding food processing industry

##### Potential Long-Term Outcomes

The potential long-term outcome of the project:

- Improved food processing and preservation industry
- Increased awareness on food preservation techniques

#### IMPLEMENTATION

##### Institutional Arrangement

The project will be implemented by the Appropriate Technology Section (ATS) in collaboration with local communities.

### Risks and Barriers

Potential risks and barriers to the success of the project are:

- Inadequate support and involvement of critical stakeholders
- Insufficient financial resources

### Evaluation and Monitoring

Monitoring committees will work in close collaboration with the Appropriate Technology Section. Monitoring and evaluation will be done on regular basis. The coordinating ministry will prepare quarterly progress and financial reports to the international funding agency during the implementation of the project.

### COST

*Estimated cost USD 620,000*

<b>Activity</b>	<b>COST (USD)</b>
Improve community food preservation and processing industry	380 000
Strengthening development of appropriate technologies for food preservation (e.g. driers, canneries etc.)	240 000
<b>Total</b>	<b>620 000</b>

# LIBERIA

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## NAPA PRIORITY PROJECT 1 INTEGRATED CROPPING/LIVESTOCK FARMING

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### BACKGROUND

The Liberian economy is dualistic, characterized by a traditional subsistence sector, which engaged in agriculture and a modern sector, mainly export oriented. The traditional sector, although employing over seventy percent of the labor force, contributes less than one-fifth to the GDP.

### JUSTIFICATION

Liberia's agriculture is agrarian. The civil war destroyed the agricultural infrastructure and disrupted farming. There was large population displacement, particularly the rural one into IDPs' and refugees' camps. Farms and equipment were abandoned and looted, with livestock either killed or looted by fighters of the civil war. The Central Agriculture Research Institute (CARI), responsible for research activities including the development of germplasm and breeding of animals, was vandalized and destroyed. The Ministry of Agriculture was not spared by the destruction and looting of the civil war. This has created an acute shortage of planting materials and livestock and livestock products in the country. Reviving agriculture to its pre-war levels with emphasis on slash and burn method, will further increase forest cover/vegetation loss, a major contributing factor to climate change in Liberia according to the vulnerability assessment of NAPA.

Integrated cropping and livestock farming is a low cost alternative to increased agricultural productivity and ensuring ecological integrity. This method of farming will further help address the severe food security problem Liberia face which is at crisis proportion in rural areas. With fifty four percent (54%) of the estimated 2.9 million population of Liberia being rural and survive on subsistence agriculture, farming method with such potential is therefore desirable if alleviating poverty and enhancing food security at the local level will be a reality.

### DESCRIPTION

#### **Overall Objectives**

The primary objective of the project is to reduce vulnerability of farmers to climate change by diversifying crop farming through the cultivation of soybeans, lowland rice and small ruminants rearing.

#### **Goals**

The major goals of the project are as follows:

- To reduce to a considerable extent the impacts of extreme effects of weather on farm productivity;
- To encourage and promote the diversification of sustainable agricultural productivity;
- To increase food production level of farm families;

#### **Expected Results**

The major results expected from the implementation of the project are as follows:

Rural communities capacities strengthened;  
 Increased in sustainable livestock and crop production;  
 Poverty levels at both national and households levels reduced;  
 Farmer's income increased due to diversify agricultural production;  
 Malnutrition levels amongst rural communities reduced.

#### **Activities**

The major activities of the project are as follows:

Project staff and relevant stakeholders incorporated;  
 Identified and recruit extension agents to provide technical backstopping in existing agricultural zones;  
 Introduce and popularize lowland farming methods as a way of reducing pressure on forest cover or vegetation;  
 Provision of crop varieties and improved breeds of livestock and medication;  
 Provision of requisite inputs to enhance project objectives.

#### **Indicators**

The major indicators that will be reviewed to assess the efficacy of the project are as follows:

Considerable number of rural community people experiencing increased agricultural activity;  
 Increased number of farmers adopting diversified agricultural production;  
 Number of malnourished and under nourished population reduced;  
 1,500 poverty stricken farm families recruited to adopt appropriate technologies in sustainable livestock production.

#### **Risks**

There are two major risks associated with the implementation of the project, namely the security situation of the country and the potential non-cooperation of farm families to adopt to the proposed method of farming

#### **Institutional Arrangement**

The key national institutions that would be involved in the process are the Ministry of Agriculture, World Vision-Liberia, and the Sustainable Enterprise Development Foundation

#### **Duration**

The duration of the project is set for twenty-four (24) months

#### **COST**

*A total budget of USD 5 million is needed.*

# MADAGASCAR

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## NAPA PRIORITY PROJECT 003

APPUI À L'INTENSIFICATION DE LA PRODUCTION VÉGÉTALE ET ANIMALE À TRAVERS NOTAMMENT L'ACQUISITION DE MATÉRIELS AGRICOLES, LA DISTRIBUTION D'INTRANTS, LE DÉVELOPPEMENT DES ACTIVITÉS GÉNÉRATRICES DE REVENUS DANS LES DIFFÉRENTES FILIÈRES PORTEUSES RÉGIONALES, APPUI À LA PROMOTION DE LA CAMPAGNE DE VACCINATION BOVINE

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### JUSTIFICATION

Les pauvres sont les couches les plus vulnérables aux changements climatiques. Afin de les rendre plus résistants et d'accroître leur capacité d'adaptation aux chocs climatiques, ce projet vise l'augmentation de la production dépassant le stade de l'autoconsommation et d'en dégager des surplus commercialisables pour l'amélioration du revenu et du bien être social.

### DESCRIPTION

#### Objectif

Augmentation de la production animale et végétale, dégagement de surplus commercialisé pour l'amélioration de revenu et du bien être social.

#### Activités

- Appui à l'intensification de la production végétale et animale à travers notamment l'acquisition des matériels agricoles, la distribution d'intrants;
- Appui au développement des activités génératrices de revenus dans les différentes filières porteuses régionales;
- Appui à la promotion de la campagne de vaccination bovine.

#### Intrants

Agronomes, Economistes, ONGs, MAEP, Autorités décentralisées et déconcentrées au niveau régional et communal, matériels et intrants agricoles et d'élevage, moyens financiers pour les encadrements techniques, groupements des paysans bénéficiaires.

#### Résultats attendus à court terme

- Groupement des paysans formés et encadrés en techniques modernes de production;
- Augmentation de la production agricole et d'élevage;
- Augmentation des activités génératrices de revenu dans les différentes filières porteuses régionales;
- Augmentation des bovins vaccinés;
- Techniques vulgarisées et diffusées au niveau des producteurs.

#### Résultats potentiels à long terme

Développement de l'économie du marché dans le monde rural.

**MISE EN ŒUVRE****Arrangements institutionnels**

MAEP, Autorités Régionales et Communales, organismes d'encadrement paysanne, Organisme de crédit, Techniciens agricoles; Les associations et/ou les paysans bénéficiaires de ce projet.

**Risques et obstacles**

Capacité d'assimilation de la population cible en matière de nouvelles techniques agricoles

Manque d'esprit d'entreprises

Faiblesses des moyens matériels

**RESSOURCES FINANCIÈRES**

*USD 270,000*

Indicateur objectivement vérifiable (IOV)	Montant (USD)		
	ANNEE 1	ANNEE 2	ANNEE 2
<ul style="list-style-type: none"> <li>• Nombre de formation dispensée et adoptée;</li> <li>• Nombre de matériels dotés;</li> <li>• Nombre de centre d'approvisionnement en intrants agricoles.</li> </ul>	90 000	90 000	90 000
<b>TOTAL</b>			<b>270 000</b>



# MALAWI

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## NAPA PRIORITY PROJECT 1

### MALAWI NAPA PROJECT (a)

#### IMPROVING COMMUNITY RESILIENCE TO CLIMATE CHANGE THROUGH THE DEVELOPMENT OF SUSTAINABLE RURAL LIVELIHOODS

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##### RATIONALE

Poverty in Malawi is widespread and deep, with 65% of the population living below poverty. Over 85% of Malawians live in rural areas, with the majority depending on subsistence rain-fed agriculture, and relying on a single maize harvest for their livelihoods. As such, they are very vulnerable to climate-related natural calamities and disasters, such as floods and droughts, which directly affect agricultural productivity. For example, the 1991/1992 drought and the 2001/2002 floods had devastating effects on crops, livestock, wild animals, vegetation and the environment, which adversely affected many Malawians, especially those living in the Rift Valley areas, such as the Shire Valley, Salima and Karonga. Combined with the impacts of HIV/AIDS, which is killing the productive age groups, orphaned children and the aged are the most vulnerable groups. The poorer segments of the population are affected the most since they have little or no means to cope and adapt in times of disaster or need.

The integrated sustainable livelihood project would enhance people's capacity to cope with and adapt to these natural calamities in vulnerable areas. The major sustainable livelihood interventions for coping with these natural calamities include the promotion of the following: (i) water management, purification and utilization, (ii) crop and livestock production, (iii) growing a diversity of crop varieties and fruit trees and rearing of animal breeds that are drought tolerant; (iv) domestication of indigenous fruit trees, and small animals, such as rabbits and guinea fowls; (v) using agroforestry practices; (vi) fish farming and processing; (vii) agro-processing; (viii) market access; and (viii) cross cutting issues: HIV/AIDS, gender and the environment.

Information and knowledge sharing are necessary for enabling various stakeholders make informed choices and decisions. The stakeholders include policy makers, vulnerable groups, research and extension workers, civil society and the mass media. The implementation of these sustainable livelihood strategies will complement existing programme and projects which the Government of Malawi/UNDP and NGOs, such as Concern Universal, World Vision International and the Miombo Network are doing in some districts of the country. The projects will improve the livelihoods of rural communities, save lives, minimize economic losses, ensure food security, reduce poverty, increase choices and reduce the vulnerability of the rural communities.

This is a project that will require a multi-sectoral approach. The key sectors include agriculture, water, fisheries, wildlife and human health, and private sector organizations, including civil society, non-governmental organizations (NGOs) and community based organizations (CBOs).

## DESCRIPTION

### Objective

The main objective of this project is to develop and promote user-friendly sustainable livelihood strategies to target communities in areas that are vulnerable to climate change, such as the Shire Valley in southern Malawi.

### Activities

The main activities to be conducted include:

- Conducting baseline and resource mapping surveys;
- Using participatory approaches and joint planning activities with rural communities to identify sustainable livelihoods;
- Developing and implementing strategies using a sectoral approach;
- Implementation of project activities through:
  - Demonstrations and technology marketing
  - Capacity building
    - Technical skills
    - Equipment
    - Resources;
- Executing the project in collaboration with rural communities;
- Mounting monitoring and evaluation exercises;
- Reporting;
- Applying the lessons to other areas.

### Inputs

The project will require human, financial and physical resources, which will be detailed out in the final project proposal.

### Short-term outputs

Sustainable livelihood strategies developed, communities' capacity enhanced, interventions adopted and utilized by rural communities that will enable them adapt and cope with climate-related natural calamities and disasters.

### Potential long-term outcomes

Improved quality of life of the peoples, reduced economic losses, and improved access to food and water, increased number of alternative livelihoods (in addition to farming) and enhanced protection of natural resources and the environment.

## IMPLEMENTATION

### Institutional arrangements

The lead implementing agency will be the Ministry of Agriculture and Food Security. The key stakeholders include: Ministry of Local Government, Ministry, of Lands, Physical Planning and Surveys, Department of Relief and Disaster Preparedness, Ministry of Health and Population Ministry of Water Development, Fisheries Department, academic and research institutions, Department of Meteorological Services, donor agencies, District Assemblies and NGOs.

### Risks and barriers

The major risks and barriers include:

- Viability of the developed sustainable livelihood strategies,
- Willingness of local community based organizations (CBOs), NGOs and other institutions to support the initiatives,

Willingness of the communities to adopt the developed technologies, and

Local beliefs in implementing the developed technologies.

**Monitoring and evaluation**

There will be a continuous monitoring exercise by the Ministry of Agriculture and other implementing agencies, while the evaluation exercise will be done by the EAD. Both mid-term and the final monitoring and evaluation reports will be produced.

Log frame for improving community resilience to climate change through the development of sustainable rural livelihoods

	<b>Narrative of the Intervention Logic</b>	<b>Objectively Verifiable Indicators (OVIs) of Achievement</b> <b>Source and Means of Verification (SMV)</b>
<b>Overall objective</b>	Enabling communities to cope with climate change to ensure food security, reduce poverty and ensure proper utilization of natural resources through the development and implementation of sustainable livelihood strategies	Alternative sustainable livelihood strategies available to rural communities
<b>Project purpose</b>	To develop and promote user-friendly and sustainable livelihood strategies by growing crop varieties and rearing animal breeds that are drought and disease tolerant, domestication of indigenous fruit trees and animals, agro-processing, market access, flood control management and the proper utilization of residual soil moisture in dambos, wetlands and low lying river valleys, as well as mainstreaming cross cutting issues of HIV/AIDS, gender and environment.	Number and quantity of new crop varieties in use; Number and quantity of animal breeds in use; Number and availability of indigenous fruit trees; Number of people growing “winter” crops, i.e., during the dry season using residual soil moisture; Number of fish farms established; Range and number of processed products available; Number/ age/ gender of beneficiaries trained; Types and number of skills attained; Number of enterprises developed; Number of new markets established.
<b>Expected results</b>	Awareness of targeted communities on: Growing crop varieties that are drought and disease tolerant; Rearing animal breeds that are drought and disease tolerant; Domesticating indigenous fruit trees; Controlling and managing rainwater and floods; Managing residual soil moisture; Utilizing residual soil moisture in an effective and efficient manner.	Increased adoption and utilization of new and improved crop varieties and animal breeds; Increased utilization of dambos for crop production; Improved nutrition through the eating of indigenous fruits, meat, milk and their products; Reduced flooding and proper use of conserved rain-water for irrigation and domestic purposes; Increased availability of irrigated crop varieties.
<b>Activities</b>	Conducting surveys to establish baseline data; Developing and/or enhancing appropriate sustainable livelihood strategies in collaboration with rural communities using PRA approaches; Developing and transferring new/improved technologies; Popularizing new and improved technologies through field days, demonstrations, mass and print media, and the training of rural communities and field extension staff.	Detailed budget (USD 4.5 million) compared with expenditure reports, and project reports (monthly, quarterly and annual).

**Project duration**

Three years

**COST**

<i>Estimated at USD 4.5 million</i>
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**Budget Breakdown**

	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
Baseline and resource mapping survey	300 000		
Participatory planning for sustainable livelihood	320 000		
Development of implementation strategies (based on sectors)	200 000		
Project implementation			
Demonstration/technology marketing	600 000	600 000	600 000
Capacity building			
Technical skills	150 000	150 000	150 000
Equipment (windmills)	600 000	600 000	600 000
Resources (dams)	200 000	200 000	200 000
Implementation	150 000	150 000	150 000
Monitoring and evaluation	100 000	100 000	150 000
General project management			
Operational expenses	100 000	100 000	100 000
Equipment	75 000	75 000	75 000
Reporting	25 000	25 000	25 000
Stakeholder consultations/workshops	100 000	100 000	100 000
Public awareness/disseminations of findings for replication and application	50 000	100 000	100 000
<b>Total Cost of the Project</b>	<b>1 800 000</b>	<b>1 350 000</b>	<b>1 350 000</b>

# MALAWI

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## NAPA PRIORITY PROJECT 3

### MALAWI NAPA PROJECT (c)

#### IMPROVING AGRICULTURAL PRODUCTION UNDER ERRATIC RAINS AND CHANGING CLIMATIC CONDITIONS

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##### RATIONALE

The agriculture sector is the driver of Malawi's economy. It contributes 35 to 40% of Gross Domestic Product (GDP), provides employment to 85% of the workforce, and contributes 85 to 90% of foreign exchange earnings and 60 to 70% of raw materials for the manufacturing sector. Any adverse event that affects agricultural production impacts directly on the life of every Malawian. Over 85% of Malawians live in the rural areas deriving their livelihoods from rain-fed subsistence agriculture. Rain-fed agriculture is vulnerable to climate-related natural calamities and disasters, especially extensive dry spells and droughts.

Malawi has experienced changing rainfall patterns in recent years, including changes in the on-set of rains, irregular and uneven rainfall distribution, dry spells, and torrential rains. Some areas, such as Karonga, have sometimes experienced prolonged dry spells and torrential rains resulting in droughts and floods in the same season. The extreme weather events often result in total loss or marked reduction in crop and livestock production. This situation has been worsened by the fact that there are a few initiatives that are specifically targeted at promoting crop and livestock diversification, or the growing of crop varieties or rearing livestock species, that are tolerant to the erratic rainfall and drought.

In the past, the general policy had been to promote maize as the main staple food crop for the whole country, despite the fact that people in some communities, eat sorghum, cassava or bananas as their main staples, and not maize. This approach perpetuated the problem of food insecurity. To improve food security, the government is currently promoting crop diversification, as well as the eating of a wide the range of different foods, such as cassava, sorghum, millets, sweet potatoes, small stock (goats, pigs and sheep), with the overall objective of improving agricultural productivity to ensure food security, improved nutrition, and increased incomes.

##### DESCRIPTION

###### **Objective**

The main objective is to improve agricultural productivity in areas characterized by erratic rainfall so as to improve the living standards and sustainable livelihoods of vulnerable rural communities.

###### **Activities**

Mapping out vulnerable areas and identifying drought tolerant crops such as cassava, millet, sweet potatoes and animals;  
 Multiplying and distributing appropriate crop and animal varieties;  
 Training farmers and field extension staff on agricultural husbandry practices;  
 Disseminating extension messages on the crops and animal varieties;  
 Irrigation Farming;

Training farmers on storage, utilization and value-adding to their crops and animals products;  
Monitoring and evaluation of the programmes.

#### **Inputs**

The inputs include equipment, human, physical and financial resource.

#### **Short-term outputs**

- Communities in target areas will be growing crops and rearing livestock that are drought tolerant;
- Reduced malnutrition among children and vulnerable groups;
- Increased production of crops and livestock for home use and market sale;
- Communities in target areas will be processing their produce to add value.

#### **Potential long-term outputs**

In the long-term, the living standards of rural communities will be improved through the use and sale of excess crops, meat, milk and other processed products.

### IMPLEMENTATION

#### **Institutional arrangements**

The project will be implemented by the Ministry of Agriculture in collaboration with rural communities, and civil society, including NGOs and CBOs, Bunda College of Agriculture, and other relevant stakeholders.

#### **Risks and barriers**

- Destruction of crops, such as cassava, by livestock and wild animals;
- Accelerated erosion due to overgrazing and poor crop and livestock husbandry practices;
- Potential for further disease and insect pest outbreaks if appropriate control measures are not put in place;
- Inadequate land for grazing, due to more land being put to crops, and many animals.

#### **Monitoring and evaluation.**

This will be done through the following:

- Monthly and quarterly narrative reports;
- Financial reports;
- Feedback from the communities implementing projects.

MoA will conduct the monitoring exercise on a continuous basis, whereas EAD will coordinate all evaluation activities.

**Log frame for Improving agricultural production under erratic rains and changing climatic conditions**

	<b>Narrative of the Intervention Logic</b>	<b>OVI of Achievement; and Sources and Means of Verification</b>
<b>Overall objective</b>	The main objective of this project is to improve agricultural productivity in areas of erratic rainfall, thereby enhancing the living standards of rural communities	Availability of reliable sources of food and cash/income from crops and animals and/or their products
<b>Project purpose</b>	<p>To introduce improved drought tolerant crop varieties and animal breeds;</p> <p>To multiply and distribute improved crop varieties and animal breeds;</p> <p>To train farmers on improved crop and animal husbandry practices;</p> <p>To train farmers on value adding initiatives.</p>	<p>Number of improved crop varieties and animal breeds with the communities;</p> <p>Availability of seed and animal multiplication programmes in the communities;</p> <p>Number of trained extension staff and rural communities in the management of improved crop and animal husbandry practices;</p> <p>Number of animals sold or slaughtered for meat;</p> <p>Amount of milk produced by the communities;</p> <p>Types and amount of other processed products produced,</p>
<b>Expected results</b>	<p>Communities in targeted areas are growing drought tolerant crops and rearing small stock (goats and sheep);</p> <p>Reduced malnutrition among children and vulnerable groups;</p> <p>Communities are producing excess produce for sale;</p> <p>Communities are processing produce for sale.</p>	<p>Number of people in the community growing or rearing improved crop varieties or improved animal breeds;</p> <p>Number of malnourished children and vulnerable groups;</p> <p>Number of available crop and animal products;</p> <p>Number of trained people in proper management of improved crop and animal husbandry practices.</p>
<b>Activities</b>	<p>Mapping out vulnerable areas and identifying suitable crops and animals for the areas;</p> <p>Multiplying and distributing appropriate crop varieties and animal breeds;</p> <p>Training farmers on appropriate crop and animal husbandry practices;</p> <p>Disseminating extension messages on crop varieties and animal breeds;</p> <p>Training farmers on storage, utilization and value-adding of the outputs from crops and animals;</p> <p>Monitoring and evaluate</p>	<p>Detailed budget (USD 3.00 million ) versus expenditure report;</p> <p>project reports (monthly, quarterly and annual.</p>

**COST**

*Estimated at USD 3 million.*



**Budget breakdown**

	Year 1	Year 2	Year 3
Baseline surveys and zoning areas/crops	400 000		
Seed multiplication	170 000	170 000	170 000
Capacity building Crop and animal husbandry Agro-processing/ value adding	275 000	275 000	275 000
Equipment	300 000	300 000	300 000
Extension services	105 000	105 000	105 000
Project management & M&E Operations Equipment Consultative workshop	350 000	300 000	300 000
<b>Total Cost of the Project</b>	<b>1 600 000</b>	<b>1 150 000</b>	<b>1 150 000</b>

# MALDIVES

## NAPA PRIORITY PROJECT 6

### INCREASE THE RESILIENCE OF LOCAL FOOD PRODUCTION THROUGH ENHANCING THE CAPACITY OF FARMERS, LOCAL COMMUNITIES TO ADDRESS FOOD SECURITY ISSUES CAUSED BY CLIMATE CHANGE AND CLIMATE VARIABILITY

#### RATIONALE

Climate change will impact agriculture and food production in the Maldives through sea level rise, salt intrusion into the ground water aquifer, salinization of soil and flooding caused by increased rainfall. In addition, the heavy import dependency of the Maldives for almost all of the food requirements makes the Maldives vulnerable to climate change impacts on the agriculture sector of other countries. The NAPA process has identified increased local food production as a key adaptation measure to tackle such food security issues posed by climate change.

Presently, in the Maldives, farming is done on subsistence to small and medium scale commercial level. Increasing local food production would require improving the sustainability and productivity of existing farming schemes through increased knowledge of innovative farming techniques, marketing approaches and particularly, strengthening of the links to consumer markets. This project is designed to increase the capacity of farmers and communities by enhancing knowledge, access to technologies and best practices. The most lucrative market for local farmers is the tourism industry and hence, this project focuses on analyzing the tourism market for local agriculture produce and trial commercial scale production based on the tourism market.

#### DESCRIPTION

##### Goal

To improve local food production for food security by introduction of sustainable commercial scale food production

##### Objectives

Strengthen the links between farmers and consumer markets to ensure sustainable local food production;

Improve local food production and at the same time reduce dependency on food import

##### Activities

##### Agriculture market analysis.

Undertake an analysis of the tourism market for major agricultural consumer preferences, including identification of options for development of local production

Identify future expansion options of local produce

Based on the tourism market analysis, trial an identified food produce(s) for commercial scale production

Educate farmers on commercial farming practices and on maintaining quality standards required for the tourism market.

Explore options for value-adding through further processing and branding of local produce

Develop information kits on commercial farming and value-adding practices for local farmers

**Short-term outputs**

Agriculture market analysis report developed;  
Commercial scale farming introduced and trialled;  
Value-added to local produce;  
Community education materials developed and disseminated.

**Potential long-term outputs**

Improved sustainability and productivity of existing farming schemes;  
Increased local adaptive capacity to tackle food security issues.

**IMPLEMENTATION**

**Institutional arrangements**

**Lead agency**

Ministry of Fisheries, Agriculture and Marine Resources.

**Project Partners**

Ministry of Atolls Development; Ministry of Tourism and Civil Aviation; Atoll Offices; Island Offices; NGOs and community level organisations

**Risks and Barriers**

Lack of human resources, technical expertise and financial resources.

**Evaluation and monitoring**

The project will be monitored according to the national M&E standards set by President's Office and MPND. Quarterly progress reports, expenditure reports, annual monitoring reports will be submitted to MPND. In addition, any donor finance agency requirements on M&E will be fulfilled.

**FINANCIAL RESOURCES**

*The total project cost is USD 825,000*

An activities based budget for the project is given below.

<b>Activity</b>	<b>Cost (USD)</b>
Agriculture market analysis	10 000
Establishment of commercial scale farming	615 000
Educate farmers on commercial farming practices and on maintaining quality standards required for the tourism market.	50 000
Explore options for value-adding through further processing and branding of local produce	100 000
Develop information kits on commercial farming and value-adding practices for local farmers	50 000
<b>Total</b>	<b>825 000</b>

# MALDIVES

## NAPA PRIORITY PROJECT 9

### INVESTIGATING ALTERNATIVE LIVE BAIT MANAGEMENT, CATCH, CULTURE AND HOLDING TECHNIQUES IN THE MALDIVES TO REDUCE VULNERABILITY OF THE TUNA FISHERY SECTOR TO THE PREDICTED CLIMATE CHANGE AND VARIABILITY

#### RATIONALE

Rationale The ability of Maldives to manage its fisheries is crucial to sustain livelihoods and social and economic well being. The fishery catches almost 150,000t of tuna every year with fish exports valued at US\$88 million. The fishing activity itself provides direct employment for about 16,000 people and thousands more in post-harvest activities. The fisheries contribution to annual GDP is more than 7 percent.

Live bait is a pre-requisite for the pole and line fishery in the Maldives. Without adequate and continuous supply of live bait pole-and-line fishery will not exist. Coral reefs are the habitats for live bait and they are highly vulnerable to changes in SST and other climate changes. This has significant implications for the availability of bait as shown by the 1998 coral bleaching event when abundance of long nose file fish (*Oxymonocanthus longirostris*) rapidly declined. With such direct vulnerability of live bait availability to changes in coral reef ecosystem evident, it is imperative that alternative ways and means of live bait is sought to adapt to climate change. One obvious means is mariculture. Captive culturing of live bait species is new and needs to be investigated in the Maldives. The possibility of catching live bait in the open outer atoll water will be another useful adaptation option. It will have the additional benefit of relieving exploitation pressure on coral reef for live bait. This will contribute to richer biological diversity and sustainable ecotourism development.

If successful, the activities proposed in this project have potential to limit or cease the bait fishing activities on the reef thereby promoting sustainable use of the coral reefs and making them more resilient to natural disturbances caused by climate change. The expected benefits in the immediate term would be better know how, and demonstration of alternative bait fishing methods and bait fish breeding options. Fishery research and development is a key priority policy in the seventh National Development Plan (NDP) and research on bait fish is a priority strategy of the seventh NDP. In addition to the national benefits, the proposed project would generate several global benefits and help fulfill important obligations of the Maldives under international conventions and agreements relating to sustainable use of living marine resources, and maintaining biodiversity.

#### DESCRIPTION

##### Goal

Better bait fishery management and exploration of alternative techniques of live bait catching, culture and storage to reduce the vulnerability of bait fish to predicted sea surface temperature changes and consequent habitat changes.

**Objective**

Enhance the knowledge on bait use and utilization, alternative live bait, catching methods and improved holding techniques.

**Activities**

Undertake a comprehensive analysis of bait fishing in the Maldives:  
 Review of bait biology, bait use and utilization,  
 Catalogue and map popular bait fishing grounds in each atoll;  
 Develop and implement a pilot on mariculture of alternative bait species;  
 Conduct bait fishing trails in various regions of the Maldives in different periods to investigate efficacy of attracting live bait using different methods;  
 Evaluate the cost effectiveness of alternative methods of bait catching;  
 Develop and disseminate information of findings to fishing communities.

**Short-term outputs**

Targeted research study reports on bait biology, use and utilization;  
 Bait resource use maps for each atoll;  
 Practicality and applicability of mariculture for bait trialled;  
 Information made available on different methods of attracting live bait;  
 Economic and financial feasibility of alternatives to bait and different methods of bait catching established;  
 Information material developed and disseminated.

**Potential long-term outputs**

Well informed decision making for sustainable development & management of bait fishery based on up-to-date scientific knowledge.

**IMPLEMENTATION****Institutional arrangements****Lead agency**

Marine Research Centre/ Ministry of Fisheries, Agriculture and Marine Resources

**Project Partners**

Ministry of Environment, Energy and Water; Ministry of Economic Development and Trade; Fishing communities.

**Risks and Barriers**

Research and development investments are low in the Maldives;  
 Few qualified scientists.

**Evaluation and monitoring**

The project will be monitored according to the national M&E standards set by President's Office and MPND. Quarterly progress reports, expenditure reports, annual monitoring reports will be submitted to MPND. In addition, any donor finance agency requirements on M&E will be fulfilled.

**FINANCIAL RESOURCES**

*The total project cost is USD 1,027,000*

An activities based budget for the project is given below.

<b>Activity</b>	<b>Cost (USD)</b>
Undertake a comprehensive analysis of bait fishing in the Maldives	10 000
Develop and implement a pilot on mariculture of alternative bait species	450 000
Conduct bait fishing trails in various regions of the Maldives in different periods to investigate efficacy of attracting live bait using different methods	487 000
Evaluate the cost effectiveness of alternative methods of bait catching	
Develop and disseminate information of findings to fishing communities	80 000
<b>Total</b>	<b>1 027 000</b>

# MALI

## NAPA PRIORITY PROJECT NO. 1

OPTION: **ADOPTION DE VARIÉTÉS CULTURALES, ESPÈCES ANIMALES ET VÉGÉTALES AMÉLIORÉES ET ADAPTÉES AUX CONDITIONS CLIMATIQUES**

TITRE DU PROJET: **VULGARISATION DES VARIÉTÉS AMÉLIORÉES ET ADAPTÉES AUX CONDITIONS CLIMATIQUES DES PRINCIPALES CULTURES VIVRIÈRES (MIL, SORGHO, MAÏS ET RIZ)**

**Localisation:** Régions de Sikasso, Ségou, Koulikoro, Kayes Mopti et les périmètres irrigués

**Secteurs:** Agriculture

### JUSTIFICATION

La mise à la disposition des producteurs des variétés améliorées et adaptées des principales cultures vivrières comme le mil, le sorgho, le maïs et le riz et leurs paquets techniques d'accompagnement contribuera de façon significative à l'atteinte des objectifs d'autosuffisance et de sécurité alimentaire, principale politique agricole. Il est important pour les producteurs de disposer d'une large gamme de variétés performantes et adaptées aux changements climatiques, ce qui donne une grande liberté de choix à partir duquel il sera possible de minimiser les effets néfastes des changements climatiques. Cette disposition aidera à renforcer les activités en cours. Ces dernières se révèlent de plus en plus insuffisantes face aux conditions climatiques de plus en plus drastiques caractérisées par la faible quantité et l'irrégularité des pluies. Les variétés à cycle relativement long se sont révélées de plus en plus peu adaptées à la zone sahélienne.

### DESCRIPTION

#### **Objectif global**

Contribuer à l'amélioration des conditions de vie des populations face à l'insécurité alimentaire liée aux effets néfastes des changements climatiques dans les zones d'intervention du projet.

#### **Objectifs spécifiques**

- Améliorer et adapter les variétés de mil, sorgho, maïs et riz en fonction des changements climatiques;
- Mettre à la disposition des producteurs de nouvelles variétés plus performantes et plus adaptées aux changements climatiques.

#### **Faisabilité technique**

- Existence de centres de recherche performants;
- Disponibilité de compétences scientifiques reconnues;
- Existence de beaucoup d'expériences dans le domaine.

#### **Faisabilité financière**

- Appui du FEM;
- Apport de l'Etat;
- Apport des communautés bénéficiaires;
- Apport des partenaires techniques et financiers.

**Résultats attendus**

Des nouvelles variétés plus productives et plus adaptées sont obtenues;  
 Des variétés plus performantes et plus adaptées sont vulgarisées;  
 Les semences des nouvelles variétés sont produites en quantité et en qualité suffisantes et mises à la disposition des producteurs;  
 La production et de la productivité ont augmenté.

**Activités**

Sélection et/ou création variétale;  
 Tests des nouvelles variétés en milieux réels (recherche Participative);  
 Vulgarisation des nouvelles variétés retenues par les producteurs (le transfert de technologies);  
 Production de semences des nouvelles variétés.

**Risques liés au projet**

La non ouverture des producteurs aux innovations techniques;  
 Les calamités (sécheresses plus sévères, invasion des criquets,...);  
 Les contraintes génétiques et celles liées à la disponibilité des équipements nécessaires pour les recherches.

**Arrangement institutionnel**

Le projet concernera les régions ci-dessus indiquées du pays et les périmètres irrigués sous la responsabilité du CNRA (Centre National de la Recherche Agricole), la DNA (Direction Nationale de l'Agriculture), de l'IER, de l'IPR/IFRA, des structures d'encadrement techniques des zones concernées, des associations et groupements des producteurs.

**SUIVI-ÉVALUATION****Indicateurs de suivi-évaluation**

Nombre de variétés améliorées obtenues;  
 Nombre de variétés améliorées testées en milieux réels;  
 Nombre de variétés améliorées adoptées par les producteurs;  
 Taux d'augmentation de la production et de la productivité.

**Mécanismes de suivi-évaluation**

Réunions de concertation entre les chercheurs, les techniciens et les producteurs pour la validation des variétés obtenues;  
 Séances de formation pour le transfert de compétences liées à la maîtrise des techniques d'exploitation des nouvelles variétés culturales;  
 Revue à mi-parcours avec production de rapport;  
 Évaluation à la fin du projet;  
 Élaboration du rapport final.

**Durée**

Trois (3) ans

**Coût**



*USD 300,000*

# MALI

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## NAPA PRIORITY PROJECT NO. 2

### OPTION: ADOPTION DES VARIÉTÉS CULTURALES, ESPÈCES ANIMALES ET VÉGÉTALES AMÉLIORÉES ET ADAPTÉES AUX CONDITIONS CLIMATIQUES

#### TITRE DU PROJET: VULGARISATION DES ESPÈCES ANIMALES ET VÉGÉTALES LES MIEUX ADAPTÉES AUX CONDITIONS CLIMATIQUES

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**Localisation :** Sikasso, Ségou, Mopti, Kayes, Koulikoro , Tombouctou  
**Secteur :** Elevage, Foresterie

#### JUSTIFICATION

Comme l'agriculture, l'Elevage et la Foresterie sont des secteurs dépendant directement du climat. Or depuis une trentaine d'années, les conditions climatiques au Mali ne font que se dégrader avec comme conséquences la perte des sols, du matériel génétique et des espèces. Tout cela se traduit par la baisse des productions et de la productivité au niveau des secteurs sus mentionnés. Pour y faire face, les communautés locales durement affectées par les effets néfastes des changements climatiques se doivent d'adopter les espèces les mieux adaptées aux conditions climatiques actuelles.

Les bénéficiaires directs du projet seront les pasteurs et les agro- pasteurs des zones concernées.

#### DESCRIPTION

##### **Objectif global**

Contribuer à l'augmentation de la production et de la productivité pastorale et forestière dans les localités concernées.

##### **Objectifs spécifiques**

- Vulgariser les espèces animales et végétales les mieux adaptées aux conditions climatiques;
- Faciliter aux populations l'acquisition de ces espèces.

##### **Faisabilité technique**

- Disponibilité des espèces adaptées au climat;
- Existence de l'encadrement par les services techniques;
- Besoins exprimés par les populations lors des missions de terrain;
- Les objectifs du projet cadrent avec les orientations du CSLP et de la SDR.

##### **Faisabilité financière**

- Appui du FEM;
- Apport de l'Etat;
- Apport des collectivités;
- Apport des communautés bénéficiaires;
- Existence d'un certain nombre de projets et ONGs.

##### **Résultats attendus**

- Les revenus des bénéficiaires ont augmenté;

Les productions animales sont accrues;  
Les productions sylvopastorales sont améliorées.

#### Activités

Informier et sensibiliser les populations sur les avantages liés aux espèces;  
Mettre à la disposition des producteurs des espèces à vulgariser;  
Créer des pépinières;  
Vulgarisation des espèces animales et végétales;  
Suivi-évaluation.

#### Risques liés au projet

Retard sur le décaissement des fonds,  
Épidémies.

#### Arrangement institutionnel

Le projet sera sous la tutelle du Ministère en charge de l'Élevage en collaboration avec celui en charge de l'Environnement à travers leurs services techniques déconcentrés. Il sera appuyé par un comité de pilotage composé de toutes les parties concernées par le projet. Il collaborera également avec les centres de recherche implantés sur le territoire national.

#### SUIVI-ÉVALUATION

##### Indicateurs de suivi-évaluation

- le taux d'adoption des différentes espèces,
- le nombre d'espèces vulgarisées,
- le nombre de producteurs ayant adoptées les espèces retenues.

##### Mécanisme de suivi-évaluation

- suivi mensuel,
- revue à mi-parcours,
- évaluation à la fin du projet sera effectuée et un rapport final sera élaboré.

##### Durée

Deux (02) ans

#### COÛT

<i>USD 350,000</i>
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# MALI

## NAPA PRIORITY PROJECT NO. 3

OPTION: DIVERSIFICATION DES SOURCES DE REVENUS (ACTIVITÉS GÉNÉRATRICES DE REVENUS)

TITRE DU PROJET: PROMOTION DES ACTIVITÉS GÉNÉRATRICES DE REVENUS ET DÉVELOPPEMENT DES MUTUELLES

**Localisation :** Régions de Tombouctou, Gao, Kidal, Mopti, Ségou, Koulikoro, Kayes, Sikasso.

**Secteur :** Agriculture, Elevage

### JUSTIFICATION

Il ressort des résultats des missions effectuées sur le terrain que les femmes et les jeunes constituent le groupe le plus vulnérable aux effets des changements climatiques. Les sécheresses récurrentes dues aux changements climatiques ont entraîné la baisse de la production agropastorale dans les différentes localités citées plus haut. Cette situation est à la base du départ massif chaque année en exode des bras valides pour ne laisser que les femmes et les plus jeunes qui sont obligés de pratiquer du petit commerce pour s'y adapter. Ce commerce est essentiellement basé sur le jardinage et la vente des produits et sous produits laitiers issus du secteur Elevage qui, eux même sont vulnérables aux effets néfastes des changements climatiques. Pour améliorer leurs revenus et renforcer leur capacité d'adaptation aux effets néfastes des changements climatiques, la promotion des activités génératrices de revenus et le développement des mutuelles s'avèrent nécessaires.

### DESCRIPTION

#### **Objectif global**

Contribuer à la lutte contre la pauvreté à travers la diversification des sources de revenu dans les localités concernées.

#### **Objectifs spécifiques**

- Développer les activités de maraîchage et d'embouche pour les femmes;
- Aider à la création des mutuelles, des caisses d'épargne et de crédits;
- Faciliter l'accès des femmes et des jeunes aux crédits;
- Renforcer les capacités économiques des femmes et des jeunes.

#### **Faisabilité technique**

- Existence d'expériences en matière d'AGR dans toutes les localités concernées;
- Existence de structures d'encadrement (Services techniques et ONGs);
- Besoins exprimés par les populations lors des missions de terrain;
- Existence de la matière première;
- Les objectifs du projet cadrent avec les orientations de la CSLP.

#### **Faisabilité financière**

- Appui du FEM;
- Apport de l'Etat;
- Apport des collectivités;
- Apport des communautés bénéficiaires;

Existence d'un certain nombre de projets dans la zone pouvant apporter leur synergie.

#### **Résultats attendus**

Les revenus des femmes et des jeunes ont augmenté;  
Des équipements ont été fournis aux bénéficiaires;  
Les rendements des cultures maraîchères sont améliorés;  
Les productions animales et laitières sont améliorées;  
L'état nutritionnel de la population est amélioré.

#### **Activités**

Mise à disposition des semences améliorées;  
Appui en équipements aux femmes et aux jeunes;  
Achat, location et mise en valeur de terres par les femmes;  
Mise à disposition du fourrage et suivi sanitaire des animaux;  
Appui conseil aux femmes pour l'embouche et suivi sanitaire des animaux;  
Renforcement et/ou création d'une mutuelle d'épargne et de crédits au niveau des Régions concernées;  
Affectation des ressources financières nécessaires;  
Mise en place des comités de gestion des crédits;  
Information sensibilisation et formation des bénéficiaires;  
Suivi-évaluation.

#### **Risques liés au projet**

Retard dans le décaissement des fonds, rupture des semences et concurrence des produits extérieurs.

#### **Arrangement institutionnel**

Vu le caractère intégré du projet sa mise en oeuvre relèvera de plusieurs Départements ministériels notamment ceux chargés de l'agriculture, de l'élevage, du développement communautaire, de l'artisanat et de l'économie et des finances, de la promotion de la femme, de l'enfant et de la famille, des personnes âgées. Un comité de concertation composé des représentants de ces ministères; des représentants des autorités administratives, communales, et coutumières ainsi que ceux des organisations de la société civile sera mis en place. Ce comité sera chargé entre autre d'orienter et de suivre les activités du projet.

### SUIVI ÉVALUATION

#### **Indicateurs de suivi-évaluation**

Niveau de revenu des groupes cibles et niveau d'exode;  
Nombre de puits maraîchers;  
Niveau de consommation des produits;  
Nombre d'unités de transformation mises en place;  
Montant des crédits octroyés et taux de remboursement des crédits.

#### **Mécanisme de suivi-évaluation**

Suivi mensuel et revu à mi-parcours du projet;  
Évaluation à la fin du projet sera effectuée.

#### **Durée**

Deux (02) ans

COÛT

*USD 350,000*

# MALI

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## NAPA PRIORITY PROJECT NO. 4

OPTION: **DIVERSIFICATION DES SOURCES DE REVENUS (ACTIVITÉS GÉNÉRATRICES DE REVENUS)**

TITRE DU PROJET: **PROGRAMME QUINQUENNAL D'AMÉNAGEMENTS AQUACOLES AU MALI (2008-2012)**

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**Localisation:** Régions de Kayes, Koulikoro, Sikasso, Ségou, Mopti, Tombouctou, Gao, Kidal et le District de Bamako

**Secteurs:** Pêche et Pisciculture

### JUSTIFICATION

La situation de l'Aquaculture dans le monde (FAO 1989a) met en évidence le rôle croissant de ce secteur sur le plan économique, social et nutritionnel.

Le Mali représente un cas spécifique dans le développement de l'aquaculture en Afrique sub saharienne avec un réseau hydrographique de l'ordre de 4 500 km, d'eau de qualité et de la température de 25 à 30°C en moyenne annuelle, l'existence d'espèces locales telles que le silure (*Clarias sp.*) et l'*Oreochromis niloticus* (carpe) sont très appréciées par la population et se vendent facilement sur le marché. Le potentiel aménageable inventorié en 2006 dans les 8 Régions et le District de Bamako au niveau de 44 cercles et 483 Communes est de 894 335 ha sur 5512 sites.

Face à l'amenuisement progressif des ressources halieutiques conséquences des aléas climatiques, le développement de l'aquaculture est aujourd'hui la stratégie concrète indiquée pour la satisfaction des besoins des populations en poisson.

Le programme d'aménagements aquacoles constitue un élément de la mise en oeuvre de l'option du Mali de réaliser des aménagements hydro-agricoles et piscicoles dans toutes les régions du pays. Il permettra une exploitation des potentiels immenses de notre pays en la matière.

### DESCRIPTION

#### **Objectif global**

L'objectif de ce programme est de promouvoir un accroissement durable de la production piscicole et de diversifier les activités des communautés de pêche en vue de l'amélioration de leurs conditions de vie, à travers leur sédentarisation et leur participation au développement local.

#### **Objectifs spécifiques**

Les objectifs spécifiques du programme sont de:

- Aménager les mares pour l'organisation de l'exploitation durable des écosystèmes aquatiques;

- Construire des étangs aquacoles pour une valorisation du potentiel existant;

- La diversification des activités pour optimisation de la production alimentaire dans les zones où la maîtrise totale de l'eau est réalisée;

- Promouvoir l'aquaculture en cages flottantes dans les zones propices;

- Assurer une large diffusion de toutes actions menées dans le sous-secteur de la pêche et de l'aquaculture;

**Faisabilité technique**

Existence d'un potentiel important;  
 Existence d'une expertise technique;  
 Expérience des producteurs;  
 Besoins fortement exprimés par les Collectivités et les populations;  
 Document de programme adopté par le Gouvernement.

**Faisabilité financière**

Apport du Gouvernement d Mali 25% (USD 6,500,000)  
 Apport des Collectivités 3% (USD 760,000)  
 Apport demandé au FEM 72% (USD 18,500,000)

**Résultats attendus**

Amélioration de la production et de disponibilité de poisson;  
 Amélioration de la gestion des pêcheries;  
 Sédentarisation des population et réduction des migrations;  
 Diversification des activités et des sources de revenus des communautés de pêche;  
 Amélioration de la sécurité alimentaire;  
 Valorisation du potentiel et de la production;  
 Renforcement des capacités des acteurs.

**Activités**

Aménagement des mares;  
 Construction de bassins piscicoles;  
 Intégration irrigation aquaculture dans les aménagements hydro-agricoles;  
 Construction de cages flottantes;  
 Organisation des producteurs;  
 Equipement des producteurs

**Risques liés au projet**

Retard dans le décaissement des fonds.

**Arrangements institutionnels**

Le Programme sera exécuté par la Direction Nationale de la Pêche. Il sera mis en place un Comité de Pilotage au niveau national et des Comités techniques de concertation au niveau des régions. Le Comité de pilotage sera présidé par le Ministre de l'Élevage et de la Pêche et comprendra les représentants des Ministères concernés, notamment le Ministère de l'Économie et des Finances, le Ministère de l'Agriculture, le Ministère du Plan et de l'Aménagement du Territoire, le Ministère de l'Environnement de l'Assainissement, le Ministère de l'Administration Territoriale et des Collectivités Locales, le Ministère des Mines de l'Énergie et de l'Eau, le Ministère des Domaines de l'État et des Affaires Foncières, le Ministère de la Sécurité Intérieure et de la Protection Civile, le Ministère de la Promotion des Investissements et des Petites et Moyennes Entreprises, le Ministère de la Promotion de la Femme, de l'Enfant et de la Famille, l'Assemblée Permanente des Chambres d'Agriculture du Mali (APCAM), les représentants des organisations des pêcheurs. Le Comité Technique de Concertation sera présidé par le Gouverneur de Région et comprendra les services techniques régionaux des Départements composant le Comité de Pilotage, le Président l'Assemblée Régionale, les Préfets, les Présidents de Conseil de Cercle, le Président de la Chambre Régionale d'Agriculture, les représentants des



organisations des pêcheurs, le représentant des Associations signataires d'accord cadre avec l'Etat.

**SUIVI-EVALUATION**

**Mécanisme de suivi-évaluation**

Suivi mensuel;  
Suivi trimestriel;  
Revue annuelle;  
Evaluation à mi-parcours;  
Evaluation finale;  
Evaluation d'impacts.

**Indicateurs de suivi-évaluation**

Superficie de mares aménagées;  
Nombre d'étangs construits;  
Production de poisson.

**Durée**

Cinq (5) ans

**COÛT**

*USD 25,760,000*

# MALI

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## NAPA PRIORITY PROJECT NO. 5

### OPTION: RENFORCEMENT DES CAPACITÉS DES BANQUES DE CÉRÉALES AU MALI

#### TITRE DU PROJET: PROMOTION DES BANQUES DE CÉRÉALES

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Localisation: Tout le pays

Secteur: Agriculture

#### JUSTIFICATION

L'agriculture malienne est essentiellement pluviale ce qui explique sa grande vulnérabilité aux changements et à la variabilité climatique. Cette dépendance se traduit par des alternances de bonnes et de mauvaises productions aux rythmes des aléas climatiques et à la dégradation des ressources naturelles sous la pression anthropique et naturelle. La conséquence de cette situation est une insécurité alimentaire qui touche en grande partie la frange vulnérable constituée des femmes et des enfants. Pour s'adapter, les populations utilisent comme moyen de subsistance la consommation d'aliments de pénurie (cueillette des fruits et feuilles alimentaires), la vente d'articles ménagers, la coupe et vente de bois verts.

Le présent projet permettra aux populations vulnérables de faire face au déficit de production lié aux risques climatiques par la création des banques céréalières.

#### DESCRIPTION

##### **Objectif global**

Contribuer à l'amélioration des conditions de vie des populations face à l'insécurité alimentaire liée aux effets néfastes des changements climatiques dans les zones d'intervention du projet.

##### **Objectifs spécifiques**

Assurer la disponibilité permanente en vivres,  
Constituer des stocks de sécurité,  
Réduire le déficit céréalier.

##### **Faisabilité technique**

Existence de céréales sur les marchés;  
Existence d'encadrement par les services techniques et les ONGs;  
Besoins exprimés par les populations lors des missions de terrain;  
Les objectifs du projet cadrent avec les orientations du CSLP.

##### **Faisabilité financière**

Appui du FEM;  
Apport de l'Etat;  
Apport des collectivités;  
Apport des communautés bénéficiaires;  
Existence d'un certain nombre de projets dans les zones d'exécution du projet qui pourraient apporter leur synergie.

**Résultats attendus**

Les magasins sont disponibles;  
 Les stocks initiaux sont constitués;  
 Les céréales sont disponibles;  
 Les comités de gestion sont mis en place et formés.

**Activités**

Information et sensibilisation des populations;  
 Construction des magasins;  
 Achat et mise en place des stocks;  
 Gestion des stocks;  
 Mise en place des Comités de Gestion (C.G);  
 Formation des membres du C.G;  
 Suivi-évaluation.

**Risques liés au projet**

Retard dans le décaissement des fonds;  
 Non renouvellement du stock.

**Arrangement institutionnel**

Les bénéficiaires étant la population en milieu rural, le Comité Villageois de Développement (CVD) sera le maître d'ouvrage. Un comité de pilotage sera placé au niveau de chaque commune. Ce comité sera composé du Maire de la commune ou son représentant, des représentants des Comités villageois de la Commune, du représentant du service de l'agriculture.

**SUIVI-ÉVALUATION****Indicateurs de suivi-évaluation**

Nombre de rotation de stocks;  
 Nombre de magasins disponibles;  
 Quantité de céréales placées;  
 Nombre des membres des comités formés.

**Mécanisme de suivi-évaluation**

Un suivi quotidien sera assuré par le comité villageois de développement à travers le comité de gestion de la banque pendant toute la durée du projet;  
 Un suivi trimestriel sera assuré par le comité de pilotage en vue de rendre performantes les structures de base de développement;  
 L'évaluation sera effectuée par les Comités villageois (auto-évaluation) d'une part et par l'ensemble des partenaires d'autre part.

**Durée**

Deux (2) ans

**COÛT FINANCIER**

*USD 500,000*

# MALI

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## NAPA PRIORITY PROJECT NO. 15

### OPTION: PROMOTION ET CONDUITE DE RÉGÉNÉRATION DES ESPÈCES FOURRAGÈRES

#### TITRE DU PROJET: DÉVELOPPEMENT DES CULTURES FOURRAGÈRES

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**Localisation:** Delta Intérieur du Niger

**Secteurs:** Elevage

#### JUSTIFICATION

En utilisant des espèces de fourrage appropriées (Bourgou, dolique, pois d'angole et niébé fourrager), et en adoptant des pratiques de cultures et d'exploitation convenable, l'agro éleveur peut améliorer la ration alimentaire du bétail. Les espèces de plantes disponibles pour le fourrage sont nombreuses et existent pour presque toutes les régions éco climatiques. Il est important de disposer d'une large gamme d'espèces permettant de jouer sur la bonne adaptation au contexte ou à l'usage local et permettant de réduire les coûts à tous les niveaux (intrants, travail, etc.).

Toutefois, les cultures fourragères restent embryonnaires au Mali. Les quelques essais réalisés par la recherche et certains producteurs n'ont pas vraiment débouché sur une diffusion élargie.

#### DESCRIPTION

##### **Objectif global**

Disposer de l'aliment bétail de source fourragère, en qualité et en quantité, en toute saison, dans la zone du projet.

##### **Objectifs spécifiques**

- Constituer des réserves pour la période de soudure (déficit fourrager) d'où amélioration de la disponibilité saisonnière en fourrage;
- Augmenter la production de fourrage;
- Améliorer la qualité du fourrage;
- Réduire la pression sur les autres ressources naturelles;
- Disposer de l'alimentation nécessaire pour l'élevage intensif.

##### **Faisabilité technique**

- Disponibilité des espèces fourragères concernées par le projet;
- Existence d'expérience en matières de cultures d'espèces fourragères;
- Existence de structures d'encadrement (services techniques et ONGs).

##### **Faisabilité financière**

- Appui du FEM;
- Apport de l'Etat;
- Apport des collectivités et communautés bénéficiaires;
- Apport des partenaires techniques et financiers.

**Résultats attendus**

Les semences fourragères sont disponibles et produites;  
 Les cultures fourragères sont développées et vulgarisées dans la zone du projet;  
 L'alimentation du bétail est améliorée quantitativement et qualitativement;  
 Les fourrages sont estimés;  
 Les parcours des animaux sont rationalisés dans le temps et dans l'espace.

**Activités**

Collecte des semences fourragères et leur production;  
 Vulgarisation des techniques culturales et des modes de conservation des fourrages;  
 Estimation des fourrages à l'aide d'imageries satellitaires en vue de rationaliser le parcours des animaux.

**Risques liés au projet**

Diminution de la fertilité du sol (sans apport d'engrais ni de fumier), au cas où le fourrage serait exporté après fauche;  
 Compactage des sols piétinés par les animaux;  
 Risque d'introduction de maladies ou de ravageurs qui peuvent affecter la végétation indigène;  
 Risque d'introduction d'espèces devenant localement une mauvaise herbe;  
 Introduction de mauvaises herbes avec des semences de mauvaise qualité;  
 Aridité et autres contraintes climatiques majeures.

**Arrangement institutionnel**

Le projet concernera le Delta Intérieur du Niger Il sera placé sous la responsabilité de la Direction Régionale de l'Élevage (DRE) qui collaborera avec les coopératives des éleveurs et des agro éleveurs ainsi qu'avec les services techniques tels que la Direction Régionale de l'Agriculture, l'Office du Niger et la société civile.

**SUIVI-ÉVALUATION****Indicateurs de suivi-évaluation**

Nombre de semences disponibles;  
 Quantité de fourrage produit;  
 Taux d'augmentation de la production et de la productivité.

**Mécanismes de suivi-évaluation**

Vsites de terrain;  
 Revues annuelles assorties de rapports.

**Durée**

3 ans

**COÛT**

*USD 500,000*

# MALI

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## NAPA PRIORITY PROJECT NO. 17

### OPTION: PROMOTION DE L'ÉLEVAGE INTENSIF

### TITRE DU PROJET: PROMOTION DES BANQUES À ALIMENTS POUR BÉTAIL

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**Localisation:** Tout le pays

**Secteur:** Elevage

#### JUSTIFICATION

Le Mali est un pays où l'élevage représente après l'agriculture, la deuxième activité de la population composée en majorité d'agro pasteurs. L'élevage est fortement affecté par une diminution de la production fourragère et une réduction des espaces pastoraux en grande partie liée aux aléas climatiques.

Cette situation entraîne une dissémination du cheptel. Du coup, les éleveurs se trouvent affectés par l'insuffisance des produits de l'élevage avec comme conséquence l'extrême pauvreté des populations et la malnutrition des groupes vulnérables (femmes, enfants...).

Le présent projet vise à atténuer les pertes en vie du bétail par l'amélioration de la disponibilité des compléments alimentaires des animaux (graine de coton, tourteau d'arachide ....).

#### DESCRIPTION

##### **Objectif global**

Contribuer à l'amélioration des conditions de vie des populations dans les localités concernées par l'augmentation de la productivité des productions animales.

##### **Objectifs spécifiques**

- Assurer la disponibilité permanente des compléments des aliments pour le bétail;
- Atténuer les déficits fourragers,
- Constituer des stocks d'aliments bétail.

##### **Faisabilité technique**

- Disponibilité d'aliments pour bétail sur les marchés;
- Existence d'expériences en matière d'élevage;
- Existence de structures d'encadrement (Services techniques et ONGs);
- Besoins exprimés par les populations lors des missions de terrain;
- Les objectifs du projet cadrent avec les orientations du CSLP et de la SDR.

##### **Faisabilité financière**

- Appui du FEM;
- Apport de l'Etat;
- Apport des collectivités;
- Apport des communautés bénéficiaires;
- Existence d'un certain nombre de projets dans la zone du projet qui pourraient apporter leur synergie.

**Résultats attendus**

Des magasins de stockage sont construits;  
 Des stocks initiaux sont constitués;  
 Les aliments pour bétail sont disponibles;  
 Des comités des gestions sont mis en place et formés.

**Activités**

Construction d'unités de fabrication d'aliment bétail;  
 Promotion des cultures fourragères;  
 Construction des magasins;  
 Achat et mise en place des stocks de matière première;  
 Mise en place des Comités de Gestion (CG);  
 Formation des membres du CG;  
 Promotion des techniques de conservation de fourrages;  
 Suivi-évaluation.

**Risques liés au projet**

Retard de décaissement des fonds;  
 Manque de matière première pour la fabrication de l'aliment bétail;  
 Retard dans le renouvellement des stocks de matière première;  
 Manque d'eau pour les cultures fourragères;  
 Insuffisance de la production.

**Arrangement institutionnel**

Les bénéficiaires étant la population en milieu rural, le Comité Villageois (CV) sera le maître d'ouvrage. Un comité de pilotage de toutes les banques à aliment bétail sera placé au niveau de la commune. Ce comité est composé entre autres du Maire de la commune ou son représentant, de représentants des organisations des producteurs.

Le Ministère de l'Élevage et de la Pêche assure la coordination et le suivi de la mise en oeuvre du projet.

**SUIVI-ÉVALUATION****Indicateurs de suivi-évaluation**

Nombre de magasins opérationnels disponibles;  
 Quantité d'aliments de bétail produite;  
 Nombre des membres des comités formés.

**Mécanisme de suivi-évaluation**

Un suivi quotidien sera assuré par le comité villageois à travers le comité de gestion de la banque pendant toute la durée du projet;  
 Un suivi trimestriel sera assuré par le comité de pilotage en vue de rendre performante les structures de base de développement;  
 L'évaluation sera effectuée par le CV (auto-évaluation) d'une part et par l'ensemble du dispositif CP.

**Durée**

Deux (2) ans

COÛT

*USD 220,000*



# MAURITANIA

## NAPA PRIORITY PROJECT 6

### MAURITANIA NAPA SECTION 7.1 LIVESTOCK FARMING

#### PROMOTION OF LIVESTOCK MOBILITY: DISSEMINATION OF THE PASTORAL CODE AND SUPPORT MEASURES

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Locality	National
Sector	Farming
Field	Pastoralism
Type	Education and creation of awareness
PIP	Reference Development of Livestock farming

#### RATIONALE

Settlement as a consequence of climate change has considerably disturbed the organisation of livestock movement and caused the degradation of pasture lands in the populated areas, particularly around the large and relatively durable watering points (ponds and rivers) and around inhabited areas where bought-in fodder increasingly has to compensate for the decrease of pasture available. Thus, for breeders, livestock mobility is their only recourse against lack of fodder and/or water.

#### DESCRIPTION

##### Rationale

- Sustainable exploitation of natural resources;
- Improvement of livestock herders' revenue bases through organizational and investment measures.

##### Objectives

- Safeguarding of pasture space;
- Establishment of protected pasture space, creating an inalienable and indefeasible public space;
- Preservation of livestock mobility;
- Guaranteed free access for the breeders to pastoral resources (grassy, open pastures, surface or underground water, Amersal pits and licking grounds);
- Consideration of pastoral interests in all development activity involving the pastoral space.

##### Activities

- Organisation of an awareness and education campaign on the pastoral code. This will have two objectives:
  - Circulation of information on the pastoral code: this campaign will require the organisation of many workshops and meetings;
  - Identification of implementation tools.
- The campaign to create awareness of, and to educate people concerning popularize the pastoral code will take place at the local level, an area whose boundaries are acknowledged by a given local community and which is worked in the traditional way by the members of the community.
- Strengthening of the organisational capacities of the breeders through training, advice and assistance from the technical services.

- The development of support measures (investment, etc).

#### Expected outcomes

- Rational management of natural resources;
- Improvement of access to pastoral resources;
- Preservation of pastoral function of the wetlands;
- Protection of system of sustainable management of natural resources.

### IMPLEMENTATION

#### Administration Arrangements

The project will be placed under the supervision of the Department of Livestock farming. DRTE, in collaboration with the Department of Livestock farming and the regional Delegations, could undertake a campaign creating awareness and education concerning the pastoral code. However, the Department of Livestock farming, together with its decentralized technical services, will be responsible for the implementation of the infrastructures.

#### Risks and obstacles

- Partitioning of the space;
- Frustration of farmers;
- Significant fluctuation of fodder resources both in space and in time;
- Under-exploitation of the grazing routes through lack of watering points;
- Failure of system of information to farmers;
- Survival of traditional movement of livestock as regards routes followed;
- In the absence of adaptation and modification of the old systems of resource management, demographic growth, settlement of the population and the search for remunerative activity constitute threats to the environment, especially around inhabited areas;
- Quantitative and qualitative deficit of infrastructures to accommodate and care for animals in the markets, methods of transport used and by the absence of marked out routes for sending livestock to the markets and of routes for movement of herds.

#### Monitoring and assessment

##### Indicators

- Degree of awareness of pastoral code (survey) and its application;
- Number of conflicts resulting from land use;
- Composition of vegetation around water points and in the marked out spaces;
- Organisational capacity of the Socio-Professional Organisations.

#### Duration

18 months

### COST

<i>USD 300,000</i>
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# MAURITANIA

## NAPA PRIORITY PROJECT 8

### MAURITANIA NAPA SECTION 7.1 LIVESTOCK FARMING

#### PROMOTION AND DEVELOPMENT OF DOMESTIC POULTRY FARMING

Locality	National
Sector	Livestock farming
Field	Improvement of food
Type	Food security and fight against poverty
PIP	Reference Special Support Programme for Food Security

#### RATIONALE

The development of domestic poultry farming constitutes an important channel for the improvement of the living conditions of low-income households adversely affected by climate change.

Moreover, it allows rural women in particular to be reached through agreed actions for improvement, and can thus give access to the integration of women in the development of small-scale farming in general.

#### DESCRIPTION

##### Objectives

Introduction of an additional activity for rural women;  
 Development of rural poultry farming, improvement of white meat production;  
 Increase of food for consumption (especially meat);  
 Increase of income of rural women (fight against poverty).

##### Activities

The project will provide women's co-operatives with a sufficient number of hens and possibly pedigree cockerels. The main basic actions should revolve around preventive treatment, especially vaccination against Newcastle disease, and secondly, anti-parasite treatment. Drinking water must be permanently available and of good quality. Efforts should be made concerning the accommodation conditions (ventilation, no over-crowding, bedding, etc.) and hygiene.

Food should be improved through maximum use of local byproducts (sorghum, millet, calcinated bone powder, rice bran, kitchen scraps).

Finally, genetic improvement may be envisaged by the introduction of pedigree cockerels. The choice of breeding stock will be based on a thorough evaluation of their real suitability (consumption rating, growth rate, resistance to disease and to local climatic conditions).

##### Expected outcomes

- Country self-sufficiency in meat;
- Fight against poverty;
- Food security (animal proteins);
- Creation of permanent jobs;
- Improved local breeds, leading to increased production;

- Increased production (eggs and meat);
- Increase of rural women's income.

#### IMPLEMENTATION

NCFVR, through its veterinary service will pilot this operation with Administration arrangements assistance from the Department of Livestock farming and the cooperation of the National Group of Mauritanian Poultry-Breeders and women's co-operatives

#### **Risks and obstacles**

- Humidity increases parasite infection risks;
- Predators;
- Genetic constraints;
- Food value of chicken feed.

#### **Monitoring and assessment**

##### Indicators

- Share of traditional poultry farming in national production;
- Productivity of improved breeds;
- Importation of white meat.

##### Duration

2 years

#### COST

*USD 300,000*

# MAURITANIA

## NAPA PRIORITY PROJECT 9

### MAURITANIA NAPA SECTION 7.3 AGRICULTURE

#### IMPROVEMENT OF CULTIVATION METHODS IN PLUVIAL ZONES AND INTRODUCTION OF NEW VARIETIES OF DROUGHT-RESISTANT HIGH-YIELD CEREAL

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Sector	Rural Development
Locality	Adrar, Tagant, Assaba, Hodh Gharbi, Hodh Chargui, Inchiri, Guidimaka, Gorgol, Trarza and Brakna.
Field	Agriculture
Type	Support project for the upgrading of the pluvial sub-sector
PIP Reference	Support to the special programme for food security

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#### RATIONALE

Rain-fed agriculture is greatly dependent on rainfall which inevitably subjects it to the adverse effects of climate change (decrease in rains and their random nature). From this arises the necessity to improve the cultivation methods and the introduction of varieties of drought-resistant cereal.

#### DESCRIPTION

##### Objectives

- Improvement of yields taking into account cultivation methods types and the protection of crops against stray animals and their enemies;
- Effective use of the producers' working time;
- Introduction of new varieties;
- Improvement of producers' expertise to improve their performance;
- Implementation of activities to create awareness and to enable identification of the sites to be covered by the project through missions, diagnostic research, etc.

##### Activities

- Acquisition of agricultural equipment for ploughing, mowing and weeding;
- Training of producers in efficient and effective use of the equipment through training programmes, seminars, sessions, etc;
- Identification, then the experimental use, of high-yield, fast-growing varieties, suitable for various zones.

##### Expected outcomes

- Improvement of productivity of rain-fed crops;
- Increase in farmers' incomes;
- Improvement of farmers' knowledge;
- Reduction of rural exodus and ensuring food and nutritional security of the People;
- Contribution to national food security.

## IMPLEMENTATION

### **Administrative arrangements**

The project will be carried out by the NCAARD, which will establish a small steering structure, following a participatory process. It is also important that a broad, efficient and effective partnership be developed with: farmers, cooperatives, national and international NGOs involved in the pluvial sub-sector, central and regional technical departments of MRDE, the private sponsors and other stakeholders in development.

### **Risks and obstacles**

- Reluctance of producers;
- Delay in acquisition of equipment or in obtaining funds, etc.

### **Monitoring and assessment indicators**

- Crop yields;
- Farmers' incomes;
- Oasis populations' nutritional and food level;
- Permanent establishment of communities on their land (level of rural exodus).

### **Duration**

3 years

### COST

<i>USD 1,270,000</i>
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# MAURITANIA

## NAPA PRIORITY PROJECT 12

### MAURITANIA NAPA SECTION 7.1 LIVESTOCK FARMING

#### GENETIC IMPROVEMENT OF THE LOCAL BOVINE BREEDS

Locality	South and south-east Mauritania
Sector	Farming
Field	Genetic improvement
Type	Increase of production
PIP	Reference Development of farming

#### RATIONALE

Livestock farming in Mauritania is almost exclusively transhumant. In addition, the poor potential of the local breeds does not allow a high level of profitability from the activity. The production level is caused by the low genetic level of the animals. Hence the necessity to genetically improve the local bovine breeds.

#### DESCRIPTION

##### Objectives

- Improvement of milk and meat production through improvement of the genetic potential of the bovines;
- Have more productive animals, more efficient in terms of use of the resources (lower input/production ratio).

##### Activities

Improve knowledge of the performance of the various breeds depending on the main systems in which they develop. This genetic improvement is achieved through two techniques: selection and cross-breeding.

##### Expected outcomes

- Reduction of animal pressure (fewer animals to care for, for the same level of production);
- Food security;
- Health: more productive but often more vulnerable animals.

#### IMPLEMENTATION

##### Administration Arrangements

This operation will initially concern the river region. The project will be under the supervision of the Department of Livestock farming in cooperation with NCFVR, breeder organisations and private promoters. It will last four years.

##### Risks and obstacles

- Difficulties in controlling genetic progress in intensive farming systems;
- Reduction of animal bio-diversity;
- Introduction of new diseases;
- Problems, for some improved breeds, concerning living in certain environments;

- Change in the perception of the value of species and breeds;
- More choice of production characteristics;
- Need for more efficient farm management.

**Management and assessment indicators**

- Level of production;
- Animal productivity;
- Level of pressure on resources.

**Duration**

3 years

**COST**

*USD 500,000*



# MAURITANIA

## NAPA PRIORITY PROJECT 15

### MAURITANIA NAPA SECTION 7.1 LIVESTOCK FARMING

#### INTRODUCTION OF NEW FODDER SPECIES ON THE NATURAL GRAZING ROUTES

Locality	Tiris-Zemmour, Inchiri, Tagant
Sector	Livestock farming
Field	Food
Type	Development for structuring the routes
PIP	Reference Management of routes and development of
Livestock farming	

#### RATIONALE

In arid zones, the continuous degradation of the routes creates vast barren areas subject to wind and rain erosion and which are in the end lost as pasture. These barren areas end up with cover poor in vegetation and a low reserve of seed in the soil. Hence the necessity to introduce new fodder species into the natural pastures routes.

#### DESCRIPTION

##### Objectives

- Initiate rehabilitation of the routes;
- Increase plant cover by introducing appropriate species;
- Achieve a vegetation composition of the pastures offering maximum animal production in the short term and the most sustainable possible in the long term;
- Use pastures and grazing routes which have no or few surface water resources;
- Improve productivity of the herd.

##### Activities

- Planting pasture through seeding after clearing, ploughing, and preparation of the seed beds;
- Seeding by simple manual, mechanic or aerial sowing of the natural grazing routes;
- Planting of cuttings and young plants.

##### Expected outcomes

- Better provision of fodder and pasture after the establishment plants and ligneous fodder;
- Improved living standards thanks to the more stable lifestyle of the stockbreeders which gives them access to social services;
- Increase of all farming and herd parameters (milk, reproduction, meat, health);
- Improvement of bio-diversity (increase of number of species in local vegetation);
- Improvement of soil fertility;
- Increased fixation of CO<sub>2</sub> in the grazing routes.

## IMPLEMENTATION

### Administration Arrangements

The project will be under the supervision of the Department of Livestock farming in collaboration with NCFVR and NCAARD. Thus, the breeder organisations, co-operatives and NGOs active in the environment will be involved.

### Risks and obstacles

- Reduction of bio-diversity (implanting of standardized pastures, introduction of weeds and invasive species in competition with the local species);
- damage caused to the livestock during the implantation process;
- introduction of weeds, harmful insects, disease and predators;
- decrease and poor distribution of rainfall causing lowering of water table.

### Monitoring and Assessment indicators

- Difficulties in buying seeds and plants;
- Land tenure system (communal lands);
- Encroachment of sand into the pasture zones;
- Decrease of the natural fodder resources;
- Disorderly settlement and concentration of rural communities.
- Bio-diversity of the fauna and flora;
- Rate of soil vegetation cover;
- Measure of vegetation cover and measure of plant biomass (contribution to the biomass of the species sown or planted or the total vegetation cover);
- Number of heads of livestock in the rehabilitated zones;
- Evaluation of livestock mobility;
- Number of animals visiting the drinking points;
- Surface area of tree cover and barren zone (at various distances from the water sources).

### Duration

2 years

### COST

<i>USD 600,000</i>
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# MAURITANIA

## NAPA PRIORITY PROJECT 18

### MAURITANIA NAPA SECTION 7.1 LIVESTOCK FARMING

#### TREATMENT OF UNREFINED FODDER AND MANUFACTURE AND USE OF MULTI-NUTRITIONAL BLOCKS

Locality	Senegal	River Valley
Sector		Livestock farming
Field		Food
Type		Pilot project
PIP Reference		Development of farming

#### RATIONALE

The recent droughts have caused a decrease of the biomass and a reduction of the pastoral spaces, which in turn has led to the nonavailability of fodder. Thus, to remedy this situation, it is important and sensible to make use of unrefined fodder, notably rice straw, through treatment by urea and the improvement of food quality by way of the provision of multi-nutritional blocks.

#### DESCRIPTION

##### Objectives

- Enable better use by the livestock of unrefined fodder resources, with a technical advantage, i.e., improvement of the food;
- Compensate for the deficit of the feed ingested by ruminants by adding a food supplement rich in energy, nitrogen or minerals;
- Enable the animals in the extensive systems to cope better with the lack of fodder during the periods bridging the seasons;
- Increase productivity of ruminants in the dry season;
- Improvement of quality of poor fodder;
- Satisfaction of maintenance and production needs of livestock to make Livestock farming more economical;
- Increase of income of small-scale owners and agrobreeders;
- Creation of employment in the area of manufacture of multinutritional blocks and their marketing.

##### Activities

The main activities will be limited in the first year to the organisation of training on the processing of straw by urea and the manufacture of multi-nutritional blocks and practical education for the benefit of Livestock farming technicians, community educators, breeders' associations and agrobreeders.

Unrefined fodder enrichment by urea processing is envisaged on a large scale in the wilayas of Brakna, Trarza, Gorgol and Guidimakha. There are large crop residues, 40,000 tonnes for rice straw alone in the Rosso zone (Trarza).

##### Expected outcomes

- Improvement of the quality of unrefined fodder;

- Use of unrefined fodder to reduce the use of pastures and overgrazing in periods of lack of fodder;
- Creation of jobs.

### IMPLEMENTATION

#### Administrative Arrangements

The implementation of the project will be carried out by the Department of Research, Training and Education (DRTE) with the cooperation of the Department of Livestock farming.

#### Risks and obstacles

- Discontinuance of straw and harvest by-products of the production zones;
- Increase in the removal of nutrients from cultivated land;
- Reduction of the fertility of the soil if there is no other form of organic restitution;
- Risk of artificial increase in animal presence within one particular region, beyond the natural capacity imposed by the level of fodder resources;
- Concentration of nutrients in animal production areas, with the risk of water and soil pollution;
- High level of inputs;
- Low price of animal products;
- Availability of inputs (ammonium, caustic soda, urea, etc.);
- Difficulty in the supply of inputs;
- Difficulty of the technique and supply of inputs for the small-scale breeders;
- Unsatisfactory targeting of beneficiaries.

#### Monitoring and assessment indicators

- Turn-over of farming;
- Animal concentration in the zones of extensive pastures;
- Concentration of nitrates and phosphorous in the soils and water;
- Proportion of breeders having adopted the technique;
- Number of animals receiving treated fodder and blocks;
- Productivity of the animals having received treated fodder and blocks.

#### Duration

18 months

#### COST

<i>USD 300,000</i>
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# MAURITANIA

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**NAPA PRIORITY PROJECT 20**  
**MAURITANIA NAPA SECTION 7.1 LIVESTOCK FARMING**  
**DEVELOPMENT OF FODDER CROPS**

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Locality	Senegal River Valley
Sector	Livestock farming
Field	Food
Type	Pilot project
PIP	Reference Support for the fight against dangers to the crops

### RATIONALE

By using appropriate fodder species (dolichos (bean), Angola peas and forage niébé) and by adopting appropriate cropping and exploitation practices, the farmer or agro-breeder can improve the quality of his livestock. There are many plant species available for fodders which exist in almost all the eco-climatic regions. It is important to have a wide range of species allowing a good level of adaptation to the context or local usage, thus enabling reduction of costs at all levels (inputs, labour, etc.). However, fodder crops are still in the embryonic stage in Mauritania. The few trials carried out by the research unit and some producers have not really resulted in widespread dissemination.

### DESCRIPTION

#### Objectives

- Establishment of reserves for periods of hardship (fodder deficit) leading to improvement in the seasonal availability of fodder;
- Increase in fodder production;
- Improvement of fodder quality;
- Reduction of pressure on other fodder resources;
- Feed for intensive Livestock farming;
- Establishment of fodder reserves for period bridging the seasons.

#### Activities

- Provision and production of fodder seeds;
- Education in farming techniques and fodder conservation methods.

#### Expected outcomes

- Development of fodder crops;
- Giving value to agricultural by-products;
- Increase of the production per beast and per hectare (milk, meat);
- Carbon fixation in permanent pasture lands.

### IMPLEMENTATION

The project will concern the Senegal River valley (irrigated zone).

#### Administrative arrangements

Under the responsibility of the Department of Livestock farming, and will involve the co-operatives (farmers and agro-farmers) and cooperate with technical services such

as the National Centre for Farming and Veterinary Research (NCFVR), the National Centre for Agronomic and Agricultural Research and Development (NCAARD) and the National Society for Rural Development (NASORD), M'Pourié farm and interested private promoters.

**Risks and obstacles**

- Decrease in soil fertility (without provision of fertilisers and manure) in cases where the fodder is exported after reaping;
- Compacting of soils trampled by animals;
- Risk of introduction of disease or destructive birds or insects that could affect the local vegetation;
- Risk of introduction of species becoming weeds in the areas;
- Introduction of weeds along with poor quality seeds;
- Aridity and other major climatic constraints;
- Need for manpower for other agricultural tasks;
- Cost of establishment of fodder crops;
- Land not adequately secured.
- Quantity of fodder produced per area developed;
- Nutritional value of fodder plants;

**Monitoring and assessment indicators**

Livestock performance.

**Duration**

5 years

**COST**

*USD 600,000*

# NIGER

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**NAPA PRIORITY PROJECT 1**  
**NIGER NAPA IDENTIFICATION SHEET 1**  
**INTRODUCING FODDER CROPS SPECIES IN PASTORAL AREAS**

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**GEOGRAPHICAL LOCATION**

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

**SECTOR**

Cattle breeding

**RATIONALE**

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.

**DESCRIPTION**

**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



# NIGER

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**NAPA PRIORITY PROJECT 2**  
**NIGER NAPA IDENTIFICATION SHEET 2**  
**PROMOTION OF FOOD BANKS FOR LIVESTOCK**

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## 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

## RATIONALE

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...)

## DESCRIPTION

### **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.

# NIGER

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**NAPA PRIORITY PROJECT 3**  
**NIGER NAPA IDENTIFICATION SHEET 3**  
**RESTORATION OF BASINS FOR THE PROMOTION OF CROP**  
**IRRIGATION**

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## GEOGRAPHIC LOCATION

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

## SECTOR

Agriculture

## RATIONALE

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.

## DESCRIPTION

### **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.

# NIGER

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**NAPA PRIORITY PROJECT 4**  
**NIGER NAPA IDENTIFICATION SHEET 4**  
**DIVERSIFICATION AND INTENSIFICATION OF CROP IRRIGATION**

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## 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

## RATIONALE

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.

## DESCRIPTION

### **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 and 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

# NIGER

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**NAPA PRIORITY PROJECT 5**  
**NIGER NAPA IDENTIFICATION SHEET 5**  
**PROMOTION OF PERI-URBAN MARKET GARDENING AND CATTLE BREEDING**

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## GEOGRAPHIC LOCATION

Urban district of Niamey I (Urban Community of Niamey/ Niamey Region)

## SECTOR

Agriculture and cattle breeding

## RATIONALE

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.

## DESCRIPTION

### **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;

disease 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

# NIGER

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**NAPA PRIORITY PROJECT 6**  
**NIGER NAPA IDENTIFICATION SHEET 6**  
**PROMOTION OF INCOME-MAKING ACTIVITIES AND DEVELOPMENT OF**  
**MUTUAL BENEFIT SOCIETIES**

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## 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 and cattle breeding

## RATIONALE

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.

## DESCRIPTION

### Overall objective

Contribute to the fight against poverty through the diversification of income-generating 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

# NIGER

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**NAPA PRIORITY PROJECT 9**  
**NIGER NAPA IDENTIFICATION SHEET 9**  
**PROMOTION OF FOOD BANKS**

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**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

**RATIONALE**

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.

**DESCRIPTION**

**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

# NIGER

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**NAPA PRIORITY PROJECT =11**  
**NIGER NAPA IDENTIFICATION SHEET 12**  
**POPULARIZATION OF ANIMAL AND VEGETATIVE SPECIES THAT ARE**  
**MOST ADAPTED TO CLIMATIC CONDITIONS**

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## 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

## RATIONALE

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.

## DESCRIPTION

### 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

# SAMOA

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## NAPA PRIORITY PROJECT 5

### PROJECT PROFILE 5: AGRICULTURE & FOOD SECURITY SUSTAINABILITY PROJECT

#### TO MAINTAIN ECONOMICALLY SUBSISTENT AGRICULTURE AND SUSTAIN FOOD SECURITY IN COMMUNITIES

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The main agricultural and food security objectives in the PICs including Samoa are to increase domestic production and productivity, through modern technologies, and reduce dependence on food imports. In particular, emphasis is on diversification, including fruits and vegetables, to develop high value export markets and, domestically, to improve the diet and nutritional status of the population. Accordingly, improving efficient production, strengthening technology transfer and developing capacity in trade and policy, especially in a changing global environment, are seen as crucial areas in enhancing food security, market development and economic growth (FAO RPFS 2003).

Agriculture, forestry and fishing generated about 20% of GDP in 2002. The principal cash crops are coconut and taro (the country's primary staple food). Breadfruit, yams, maize, passion fruit and mangoes are cultivated as food crops. Pigs, cattle, poultry and goats are raised, mainly for local consumption. The livestock sector appears to have a less direct vulnerability to tropical cyclones with larger animals (cattle and horses) tending to find shelter unaided in windbreaks and laying to ground to minimize exposure. Direct impacts on poultry depend upon the shelter provided by the farmer. Seasonal variation will impact on pastures with a long-term possibility of altering quality and growth of the feed exposing farmers to expensive substitutes.

#### RATIONALE

Agriculture and hence food security are identified as highly vulnerable sectors for Samoa. Widespread agriculture damage caused great losses for both subsistence and commercial agriculture. Crops with low tolerance levels to climate hazards were the most threatened, including banana one of Samoa's staple crops. Pest diseases were spread by strong winds, for example, the spread of taro crop disaster of the 1990s linked to higher frequency of wind distributed disease (taro leaf blight spores). Sales of taro provided 58% of all domestic earnings in 1993, but an outbreak of the taro leaf blight devastated crop in 1994 and reduced exports to almost nil in that year and subsequent years.

By investing in stable all year round crops and vegetable farming programs instigated at the community level, Samoa will be better able to adapt and afford crops in times of extreme climatic events. Furthermore by developing alternative farming systems that improve productivity and simultaneously protect soil and water resources, of the ability to survive prolonged periods of drought and famine is substantially increased. Thus, the further development of community plantation programs and inspection management for staple and resistant crops will strengthen food security. Introducing such methods would enable the implementation team to build the local capacity of farmers in communities and provide opportunities to share and increase knowledge of agricultural and climate change issues. The availability of alternative farming

methods and systems in communities will help support this management program across all communities.

#### DESCRIPTION

##### Key Objectives

Develop an economically sustainable agricultural sector that is community-based;  
 Ensure an inspection management plan and program for community-based plantations are strengthened to maintain and secure food supply and food nutrition;  
 Ensure availability and accessibility of alternative farming systems;  
 Improve productivity of farms and plantations and at the same time reduce soil erosion and protect water resources.

##### Expected Outcomes

Sustained security of food regardless of weather conditions;  
 Improved management of village plantations;  
 Improved variety of resistant crops available across community plantations;  
 Variety of vegetable farming in communities / households.

Suggested Actions Required	Indicators / Expected Outputs	Potential Long-Term Outcomes
Initiate investment program on annual crops and home vegetable farming at a community level	Established community plantations of stable and resistant all year round crops across vulnerable communities;  Improved management committee for inspection management program for plantations;  Existence and availability of alternative farming methods and systems in communities.	Sustained security of food regardless of weather conditions;  Improved management of village plantations;  Improved variety of resistant crops available across community plantations;  Variety of vegetable farming in communities / households MOA, communities, business communities, NGOS.
Further develop an inspection management program for the plantation program		
Develop alternative farming systems that improves productivity and protects soil and water resources		
Promote cultivation and consumption of crops less affected by and immune to extreme events such as TCs, flooding, etc. (example: Umala survives cyclone impacts well)		
Promote sustainable aquaculture of native species		

##### Institutional Arrangements

Implementing Agency: Ministry of Agriculture in close collaboration with communities

Coordinating Agencies: Ministry of Natural Resources, Environment & Meteorology (MNREM)

The Ministry of Agriculture is the most suitable national agency to implement this project profile. It is proposed that MOA will undertake the above mentioned activities in close collaboration with the communities.

##### Risks and Barriers

High costs are a potential barrier for the sustainability of some of the existing coping activities identified, particularly if transferred to the rural farmer. An

- example is the safeguarding of some cash crop trees from pests using tree covering and other current netting techniques. These are expensive coping strategies for rural farmers to implement without assistance;
- Lack of technical knowledge of climate change impacts on the agricultural sector and food security;
- The lack of technical knowledge at the sectoral level with regards to climate change and its future implications is a possible barrier to the formulation of relevant and effective policies, strategies and activities;
- Possible overlapping jurisdictions regarding natural resource management and use in policies between the Ministry of Agriculture and the Ministry of Natural Resources, Environment and Meteorology;
- Lack of key information to support action, strategy and policy formulation.

#### Evaluation and Monitoring

The Project Steering Committee to evaluate and monitor climate change and adaptation strategies for the sector with focus on the following areas:

- Community based agriculture;
- Alternative farming methods.

#### COST

#### Indicative Budget

*Proposed Funding (Technical Assistance) USD 320,000*

Activity	Costs (USD)
Initiate investment program on annual crops and home vegetable farming at community levels	120 000
Develop an inspection management program for the plantation program	80 000
Develop alternative farming systems	70 000
Promote cultivation and consumption of crops	25 000
Promote sustainable aquaculture of native species	25 000
<b>TOTAL</b>	<b>320 000</b>

The government will commit in-kind contributions in support of development projects that contribute to Samoa's development strategies, overall sustainable development goals and Millennium Development Goals.

# SAO TOME E PRINCIPE

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## NAPA PRIORITY PROJECT NO. 1

### FISHERIES SECTOR PROJECT 3

#### TRAINING AND READAPT PROJECT OF THE NEW NAVIGATION TECHNOLOGIES AND FISHING EQUIPMENT FOR FISHERMEN

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#### JUSTIFICATION

Given the countless occurrences of climate phenomena that happen on the craft fishermen of S.Tomé and Príncipe and considering that for several years and for varied generations these continue traditionally to use the same types of materials and embarkations, that in more than 95% are weak autonomy and without any navigation device, and they go fishing and sometimes impeded of returning to the house. Such situations are frequent and they happen annually when, the fishermen are surprised by storms, tempest lines, fog, strong rains, etc.

The fishermen were served during years of empiric knowledge (experience practices) of navigation, being guided by the moon, stars, the sun or the relief's (picks of S.Tomé and Príncipe) as reference cardinals for to return to the origin beaches. If, for any reason, any climate factor obstructs those traditional coordinates, they are immediately seriously committed and uncertain to return to the beach or, even, be shock by embarkations of great load.

Then the need of they be prepared and equipped in order facet the situations and minimize the constraining effects of the climate factors. It was suggested the present project to focus in this matter. It will be executed by sector of Fishing, in collaboration with NGOs, MARAPA and GIEPPA. During execution, it should count with the collaboration of Institute of Meteorology for preventive information of weather as well as with the "Companhia Santomense" of Telecommunications (CST) in the domain of communication.

The beneficiaries will be selected according with the vulnerability results verified in the inquired communities as Well as in the no inquired but susceptible to CC effects. The number of beneficiaries will be superior to 200 fishermen, distributed geographically by the two Islands and involving al Districts. The cost of the project will be of approximately USD 350,000.

#### DESCRIPTION

##### **General Objective**

Reinforcement of capacity of craft fishermen to minimize the perverse effects of the climate changes.

##### **Specific Objective**

- To allow a sustained development of craft sector;
- To improve the capacities of navigation of fishermen, in way to minimize the effects of climate changes, facilitating equipments and materials to subsidized credit (GPS, compasses, embarkations with better capacity, lifejackets and signaling rockets).



**Long term potential effects**

Improvement, in more than 60%, the work conditions and income of craft fishermen;  
Reduction, in more than 70%, the accident risks or life loss.

**Institutional framework**

The project will be executed in partnership with Fisheries sector, NGO, MARAPA and of GIEPPA, with the Coastal Guard's collaboration, and it will be under the protection of the Ministry of Economy.

**Risks**

Incoherent Selection of target fishermen and vulnerability susceptible.  
Impartiality in the attribution of subsidized credit of materials and equipments.

**Evaluation and monitoring**

General Objective	Specific Objective	Expected Results	Activities	Indicators			Cost (USD)
				Actual value	Source	Value to reach	
Reinforcement of craft fishermen capacity to minimize the effects of CC	Stimulate sustainable development of craft fishing activities.	Fishermen with theoretical and practical knowledge about climatic factors that cause bad effects; Change behavior and improvement of fishing practice face to climate change.	Popularization the effects of climate change on the population; Seminars on the community; Select the focal points to do communication and sensitization systematically.	50	Fisheries sector	1200	100,000
	Improve the navigation capacity of fishermen to minimize the effects of climate change.	Fishermen capacity; Fishermen equipped; Decrease the number of disappearance in the sea; Improvement of live level of fishermen and families.	Sensitization and selection of fishermen; Acquisition of equipment; Training of fishermen; Distribution; Monitor and evaluation of action.	80	Fisheries sector	1000	250,000
<b>TOTAL</b>							<b>350,000</b>

**COST**

*USD 350,000*

# SAO TOME E PRINCIPE

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## NAPA PRIORITY PROJECT NO. 4

### FISHERIES SECTOR PROJECT 2

#### INTEGRATED PROJECT OF CONSTRUCTION AND INSTALLATION OF DEVICE FOR FISH CONCENTRATION (DFC) AND SIGNALING COASTAL ZONE

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#### JUSTIFICATION

Assisting to the characteristics of our platforms, and the archipelago to be volcanic origin and of being very uneven our sea bottom, most of the time the fishing areas are quite distant of the origin beach.

On the other hand, our ZEE disposes of many migratory species. The tunas *Katsuwonus pelamis* ", " *Thunnus albacares* ", locally known by Zudê and Oledê, respectively, they are among other species that move in the coast inside of the 12 miles, in the high sea, in the 200 miles, or still, of north to the south of the continent. Such movement implicates dislocations of fishermen for distant areas, what rarely provokes accidents and/or sudden deaths, when been hit by fog, strong winds or even torrential rains, the one that associates the physical exhaustion of hours of navigation and the lack of visibility for orientation.

In this conjuncture, if the devices of fish concentration be installed near of the coast, a lot of species will be attracted and consequently an area of close fishing will be constituted and free from great risks for the fishermen, which would be protected of the effects of tempest lines (very strong winds) as well as fogs.

In this circumstance, to facilitate the navigation and to avoid other accidents it would be imperious that these DCP went pre-sigaled, even to facilitate theirs destruction for ships of great load.

This project will benefit more than 15 communities, being 10 in Sao Tomé and 5 in the Principe, and will have a cost of \$250.000 USD, with duration of 24 months. In the end of the project, the communities will be prepared for the appropriation acquired knowledge and the perennity of the actions accomplished by the project.

#### DESCRIPTION

##### **General Objective**

To put to the disposition of craft fishermen profitable and closer fishing areas of the respective beaches.

##### **Specific Objects**

- To increase the production and the productivity and to reduce the fishing effort;
- To reinforce the participation and promotion of the Self-construction of DFC for the communities' members;
- Improvement of the physical conditions and the incomes of fishermen.

##### **Long term potential effects**

- Larger proximity to the coast of the fishing areas;
- Reduction of fishing hours and capture increase for the craft fishermen;
- Reduction in more than 50% the material losses during the fishing;



COST

*USD 250,000*

# SAO TOME E PRINCIPE

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## NAPA PRIORITY PROJECT NO. 6

### AGRICULTURE-LIVESTOCK AND FOREST SECTOR PROJECT 3 REINFORCEMENT AND DIVERSIFICATION OF AGRICULTURAL PRODUCTION

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#### JUSTIFICATION

The largest embarrassment of natural order in the agricultural sector is above all the lack of water, especially in the communities of central and north areas. The absence of an overhead irrigation makes production lowering more and more in the foregoing areas. To this nature embarrassment added the following:

- Lack of political powers;
- Lack of private initiative;
- Aging of the plantations of cocoa and coffee;
- Inflation of prices of agricultural products;
- An insufficient productive land due to the size of country and to volcanic substratum;
- Strong hilly landscape.

#### **Institutional framework**

The project execution will be in charge of agriculture sector of Ministry of Economy. The potentials intervening of project execution will be the Cabinet of Environment, NGOs, the Autarchies, the Associations of Small and Medium Farmers.

#### **Risks and obstacles**

- Extreme climate Factors (mainly linked to the temperature and the rainy);
- Attacks of curses and plants diseases;
- Erosion and soil with lixivium;
- Floods;
- Lacks of a coherent agricultural politics;
- Lack of decision maker's engagement.

#### **Evaluation and monitoring**

The actions execution enrolled in the present program can be evaluated and following through the following indicators:

- Increase in 50% the agricultural production;
- Increase in 10% the number of existent farmers' associations;
- Improvement of country trade balance;
- Increase in 80% the replanted agricultural surface;
- Increase in 5% the rural tracks;
- Increase in 10% the amount of inputs and distributed vegetable material;
- Multiplication for 25% the structures of economic boxes and credit;
- Increase in 70% the number of beneficiaries supported by the programs;
- Increase in 50% the small farmers' incomes and the entrepreneurs.

COST

<i>USD 1,650,000</i>
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# SAO TOME E PRINCIPE

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## NAPA PRIORITY PROJECT NO. 7

### AGRICULTURE-LIVESTOCK AND FOREST SECTOR PROJECT 2 INTEGRATED PROJECT OF LIVESTOCK DEVELOPMENT (GOAT AND COWS) IN THE NORTH PART OF SÃO TOMÉ ISLAND

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#### JUSTIFICATION

The conception and implementation of this project is justified because the lack of animal foods in the future, owed to the occurrence of the drought in the country, it can be very larger in the north area (Praia das Conchas, Plancas,...) than in other country areas, since is quite vulnerable (semi-arid climate). It can have cattle losses, just as it happened recently in Kenya. According to the races, the goat is one of the species that more resists to the drought, it can feed with pastures of smaller nutritional value and to rarely drink water, when compared with birds and swine; it can produce milk, cheese and local meat that are products in deficit in the country; also, produces, on the other hand, the fertilizer for land fertilization, reforestation and rehabilitation of the pasture area and production of renewable energies as the biogas.

#### DESCRIPTION

##### **Potential effects to the long term**

The fomentation and increase of goat milk production can contribute to reduce the deficit of this product; the appropriate and rational use of fertilizer as organic fertilizer for the land fertilization; the production of bio-gas will benefit the farmer.

##### **Institutional framework**

This project is pilot type and it should be implemented by Livestock sector, through the establishment of dynamic partnerships with Agriculture and Forest, and Environment sectors and the international, bilateral or multilateral technical cooperation, for the area.

After experimentation period, if the result is satisfactory, it can be popularized at the level of the averages local companies and family creators more economic and technically developed. For implementation, it should be encouraging financing at level of the private sector.

##### **Risks and obstacles**

The local urbanization is a great risk for the project implementation, because it leads to loss of areas that can be taken advantage for pasture. The lack of the creators' formation, the inadequate management and robbery can commit execution.

##### **Evaluation and monitoring**

The indicators of progress must be select (effect, impact) Of project implementation, to know: Productive Performance (liter of daily milk / annual reproductive / cost, kg cheese / year, kg fertilizes / year, biogas / kw/energy), indicators of births (no. childbirths / year...). Environmental indicators (animal load: no. of effectives/hectare of pastoral area, load..)

The evaluation and the continuation will be to do correct or appropriate adjustments to seek to improve the acting of project and to verify the defined objectives are or not to be reached her.

The project implementation demands however the application of the use of technologies and appropriate, rational practices appropriate, rational, integrated (biogas production, improvement of the forest ecosystem) and diversified (promotion of biodiversity) that seek to increase the production and simultaneously protect environment, contributing namely to the reduction of pollution and the greenhouse effect, phenomenons that can be exacerbated with the intensification of the production system (implementation risks, aberration erosion for the introduction of other races).

**COST**

*USD 900,000*



# SIERRA LEONE

## NAPA PRIORITY PROJECT NO 5

### DEVELOPMENT OF INLAND VALLEY SWAMPS FOR RICE PRODUCTION IN THE MOYAMBA DISTRICT.

#### RATIONAL/JUSTIFICATION

Of all the rice growing ecologies in Sierra Leone, the Inland Valley Swamps are now believed to have the right potentials for the achievement of self-sufficiency in rice production. According the most recent, agricultural sector Review (FAO, 2003), the IVS have the highest comparative advantage, for increased rice production.

The IVS contribute approximately 20% of the food growing area in the country (NCU, 1990). They have an estimated potential of 690,000ha and are found in all the geographical regions of the country. The productivity potential is greater than that of the uplands due to higher organic matter content and a favourable water regime for a longer period during the year. Under improved water management practices, rice yields in the range 2-3.2 tons/ha have been reported. (FAO, 2005). The high organic matter content (fertility) and favourable moisture condition make worth developing to avoid drought conditions caused by adverse climate variability on the uplands. The Moyamba district has a great potential for the development of inland valley swamp for rice production. These swamps are however under utilized and efforts for effective development can be undermined by climate change.

#### DESCRIPTION

##### **Overall Objectives**

To increase the area under cultivation for increased rice production.

##### **Specific Objectives**

- To ensure all-year-round rice production through improved water management in the inland valley swamps;
- To minimize the negative impacts of climate variability/climate change on rice production.

##### **Activities**

- Selection of inland valleys suitable for development;
- Biophysical and socio-economic surveys of suitable inland valleys;
- Technical designing of water control structures of suitable IVS for development;
- Development of suitable IVS;
- Capacity building training of farmers in operation and maintenance of water control structures;
- Provision of inputs, tools, seeds, chemicals;
- Provision of essential infrastructure (storage processing, marketing).

##### **Inputs**

- Trained engineers and technicians;
- Basic survey equipment and tools and extension staff;
- Stationery and other materials (field note books duplicating papers, drawing pens, tracing papers etc.);
- Camping equipment and other logistics;

Topographic map sheets of areas concerned;  
 Training materials;  
 Mobility (pick-up vans and/or motor bikes);  
 Fuel and oil;  
 Per diems and DSAs.

## **Outputs**

### **Short term outputs**

Data base on suitable inland valleys;  
 Well developed swamps with proper water control structures;  
 Increased area for rice production;  
 Availability of trained self reliant farmers for trouble shooting.

### **Medium to long term outputs**

Well established and proper functioning inland valley swamps;  
 Increase rice yields ranging from 203 tons/ha;  
 High quality finished local rice products available and affordable on the markets.

## **IMPLEMENTATION**

This should be highly participatory.

### **Institutional Arrangements**

#### **Government (Local and Central):** To provide:

Trained manpower (Engineers, technicians, extension staff);  
 Funds for survey equipment and logistic support (mobility, fuel and oil, camping facilities);  
 Basic infrastructure: Improved road network, marketing centres, processing and storage facilities.

#### **Private Sector:** Involvement in the

Importation of basic tools and equipment under favourable trade conditions;  
 Swamp rice production;  
 Storage and processing as well as marketing.

#### **The Community:**

Individual and farmers association to be directly involved in the formulation and implementation of IVS development projects;  
 Provision of labour, and monitoring of all activities.

### **Risks and Barriers**

High initial costs involved;  
 Low labour availability for the various development operations;  
 Low level of funding that might adversely affects the provision of basic tools, machinery and other logistic support;  
 The farming calendar: IVS development activities interfering with upland farm operations and annual social and cultural activities.

### **Monitoring and Evaluation**

Monitoring and evaluation will be undertaken form a participatory approach: The land and Water Development Division (LWDD) will be responsible for the technical aspects of monitoring while the Project evaluation monitoring and statistics Division (PEMSD) of the Ministry of Agriculture will handle the socio economic aspects. At community level and agricultural unit of the district council, as well as

community based organization such as farmer's organizations, agricultural business units (ABU) will also fully involved.

#### COST

The development of IVS will be undertaken in all Districts that have resourced number of large inland valleys worth developing. The operations will be spread over a period of five (5) years and will be undertaken in all districts at 5 ha per district, amounting to 65ha per year, and 325ha over 5 years.

*Within the 5 years period, the cost of development is estimated at USD 1,075, 000.*

#### **Budget Breakdown for IVS Development in USD, '000**

<b>Activity/Items</b>	<b>Y1</b>	<b>Y2</b>	<b>Y3</b>	<b>Y4</b>	<b>Y5</b>
Inventory of suitable IVS	40	30	20	10	-
Mobilization of manpower, logistic support, materials base maps, camping equipment.	30	30	20	20	-
Detailed bio-physical and socio-economic surveys of IVS	60	50	50	30	10
Designing of IVS, calculation of costs of development	20	10	10	10	-
Development of IVS	60	30	10	10	10
Capacity building training of technicians farmers and extension staff	20	20	20	20	20
Acquisition of basic survey equipment	50	50	50	-	-
Production input (farm tools, chemicals)	20	10	10	10	5
Monitoring and evaluation	10	10	10	10	10
<b>Total</b>	<b>350 000</b>	<b>280 000</b>	<b>240 000</b>	<b>140 000</b>	<b>65 000</b>

# SIERRA LEONE

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## NAPA PRIORITY PROJECT NO 7

### DEVELOPMENT OF IRRIGATION AND DRAINAGE SYSTEMS FOR AGRICULTURAL PRODUCTION IN THE BOMBALI DISTRICT OF SIERRA LEONE:

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#### PROJECT RATIONALE/JUSTIFICATION

Agriculture in Sierra Leone is predominantly rain fed. This is especially so in the Bombali district where frequent dry spells are experienced. It is practiced on two main ecosystems. Low lands and uplands. In the lowlands, poor drainage is a major problem and water control is the key to successful rice and other crops production. On the uplands, shifting cultivation is the dominant farming system. The uplands accounts for about 84% of the total land under rice production. The shifting cultivation practice under rain fed conditions has numerous problems which limit agricultural production and render the agricultural systems highly vulnerable to climate change.

A critical analysis of the climate and water resources of Sierra Leone in relation to agriculture suggests that the abundant rainfall, sim-chine, surface and groundwater and carbon dioxide are not being harnessed sufficiently for agricultural production.

The impacts of climate variability and possible climate change can be minimized and increased food production and food security ensured if irrigation systems are installed on the uplands and viable drainage and water control measures implemented in the lowlands.

#### DESCRIPTION

##### Objectives

The overall objective is to develop irrigation and drainage systems in the vulnerable areas of the country for increased food production.

##### Specific Objectives

- To increase food production all year round through irrigation and drainage;
- To extend the area under agricultural projection on the uplands;
- To minimize the impacts of climate variability and climate change on food production.

##### Activities

- Survey, evaluation, and classification of areas suitable for irrigation on the upland ecology;
- Survey, evaluation and design of irrigation and drainage systems for selected lowlands for crop production;
- Construction of appropriate irrigation and drainage systems;
- Capacity building and/or development within the land and water management institutions;
- Building capacities amongst farmers and extension agents in the operation and management of irrigation and drainage systems.

**Inputs**

Irrigation and drainage equipment, and materials;  
 Trained manpower (Engineers, technicians, extension staff and farmers);  
 Basic farm tools;  
 Other farm inputs (fertilizers, seeds, chemicals, credit, and regular supervision);  
 Processing, marketing and storage facilities, transportation;  
 Survey equipment (soil, hydrology);  
 Camping equipment and other facilities;  
 Information on weather and climate.

**Short Term Outputs**

Irrigation and drainage system installed in selected areas in the country;  
 Availability of well trained technicians extension agents and farmers;  
 Improved monitoring and supervision;  
 Availability of essential irrigation and drainage equipment and farm tools;  
 Increased yields;  
 Improved water control;  
 Improved processing and storage facilities.

**Potential Long term outputs**

Well established and functioning irrigation and drainage systems;  
 All year round production of food;  
 Gradual establishment of sedentary farming to replace rain fed farming;  
 Improved adaptation capacity to climate change;  
 Increase in farmers incomes, and poverty alleviation;  
 Improved storage processing and marketing of food.

**IMPLEMENTATION**

The implementation of irrigation projects shall be at small to medium levels on regional basis.

**Institutional arrangement**

Central Government: to provide adequate funding from local and foreign sources  
 Provide the enabling environment for private sector involvement in irrigation and drainage activities.

Live ministries: the Land and Water Development Division of the Ministry of Agriculture and Food Security will be the key institution for planning, designing, technical implementation, monitoring and supervision of all irrigation and drainage projects.

Local Governments, community based organizations will be encouraged to participate in the planning, implementation and monitoring of irrigation and drainage projects

Farmers Associations shall be encouraged to go into irrigation and drainage farming, processing, storage and marketing.

Research institution shall be encouraged to conduct research in order to identify appropriate irrigation systems, machinery and practices.

**Risk and Barriers**

High initial costs involved;  
 Increase in water borne diseases;  
 Low capital investment by government;

Difficulties in changing from rain fed agriculture to sunshine based (irrigation) agriculture;  
 Low labour availability in the country side where irrigation and drainage will be implemented;  
 Poor production infrastructure.

#### Monitoring and Evaluation

The land and Water Development Division will take the lead in technical monitoring and evaluation of the project, while project evaluation and monitoring and statistic. Division (PEMSD) will monitor and evaluate the economic and social impact of the project. The local organizations shall be encouraged to participate in the process.

#### COST

The irrigation and drainage projects shall be planned to cover 5-10 year cydes.

*The cost of the project with 5 years periods is estimated at USD 1,055,000 over a 5 year period.*

Implementation of irrigation and drainage projects will be the drier Northern districts (5 Districts). Koinadugu, Bombali, Tonkolili, Port Loko and Kambia.

#### Budget Breakdown ('000, USD)

Activity/Items	Y1	Y2	Y3	Y4	Y5
Inventory of Potential irrigation and drainage areas	30	20	10	5	-
Soil survey and land suitability evaluation of potential sites	50	30	20	10	-
Design of irrigation and drainage structures 10	10	5	5	5	
Acquisition of irrigation and drainage equipment	200	120	40	20	10
Capacity building mainly training and recruitment	60	40	20	10	5
Construction of structures and installation of equipment	40	35	30	20	5
Basic farm tools and other inputs	10	10	5	5	-
Production activities	50	20	10	10	10
Operation and maintenance costs	10	10	10	5	5
Monitoring and evaluation	10	5	5	5	5
<b>Total</b>	<b>465</b>	<b>300</b>	<b>155</b>	<b>95</b>	<b>40</b>

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**SIERRA LEONE**  
**NAPA PRIORITY PROJECT NO 14**  
**ESTABLISHMENT OF A PERMANENT STUDY PROGRAMME OF THE**  
**MULTI SPECIES FISHERIES IN SIERRA LEONE**

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**RATIONALE/JUSTIFICATION**

In Sierra Leonean waters, there are over two hundred species of fish. Knowledge about the biology of the majority of these species is lacking. The level of exploitation of a good number of species has also not been established.

With climate in this area likely to undergo changes, the species composition of most important species i.e. the clupeids, carangids and scombrids, which are mainly migratory and are easily affected by fluctuations of the environmental conditions within the estuaries and near shore might also undergo changes. In such an event the offshore pelagics and demersal fish species might assume high commercial importance.

Assessment of the effects of environmental conditions on fishing habitats basically employs the species – specific approach which involves the development of Habitat Suitability Index (HSD) modes for individual species of concern.

The impact of climate change on the fishery can take decades, however, the gathering of the information requires and the work of the institutions to manage the fishery would be a slow process. It is therefore necessary that the establishment of the institutional study programmes be initiated now

**DESCRIPTION**

**Objective**

- To improve knowledge about the biology of the multi-species;
- To generate species-specific habitat and physiology data;
- To generate data on habitat characteristics;
- To study the abundance, distribution and feeding habits of other fish species that have a high commercial potential value;
- To provide information on growth rates reproductive success and mortality of select species.

**Activities**

- Train researchers;
- Provide equipments;
- Provide logistics;
- Conduct field works;
- Analyse acquired/collected data;
- Develop HIS models.

**Inputs**

Human, Financial and physical resources.

**Short-term outputs**

Researchers trained equipments and logistics provided, field work conducted, and data analysed.

**Potential Long-term outcome**

Research capacity of Institute of Marine Biology and Oceanography built.

**IMPLEMENTATION****Institutional Arrangements**

Following the work of various fishery experts under various programmes etc. It is suggested that the Institute of Marine Biology and Oceanography (IMBO), USL should be adequately staffed and equipped to carry out studies on the fishery of Sierra Leone. The Board of IMBO which comprises of members from various government ministries, university and NGOs will supervise the project.

**Risks and Barriers**

Inadequate human resources;  
Insufficient financial resources;  
Beaucratic barriers.

**Monitoring and evaluation**

The Board of The Institute of Marine Biology (IMBO) will monitor and evaluate the project.

**COST**

*USD 395,000*

**Budget Breakdown**

	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
Train researchers	30 000	30 000	20 000
Provide equipments	80 000	40 000	20 000
Provide logistics	30 000	15 000	10 000
Conduct field works	30 000	15 000	15 000
Analyse acquired/collected data	20 000	10 000	10 000
Develop HIS models	-	-	20 000



# SIERRA LEONE

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## NAPA PRIORITY PROJECT NO 16

### IMPROVE ON THE QUALITY ON FISHERIES RELATED DATA AND RESEARCH

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#### RATIONALE/JUSTIFICATION

Others conservation and protection of the resources; promotion of the development of a national fishing fleet; promotion of aquaculture and inland fisheries development; research, extension and training etc.

Production can be substantial. The artisanal fishing sector if expanded can employ more than 100,000 people. Inland fishery can be developed if adequate storage and transport systems are improved.

Capacity is low in terms of scientific research which at the moment is carried out at different levels both at the ministry and the Institute of Marine Biology Oceanography, Fourah Bay College, University of Sierra Leone.

The Ministry is basically concerned with the compilation and collation of data from surveys, catch data, and observer reports. Outputs are in the form of summaries and reports.

The IMBO carries out basic research through student research supervised by research fellows/lecturers using mainly information from the statistical unit of ministry.

#### DESCRIPTION

##### **Objectives**

To improve on the quality of data and research for better understanding of the different types of ecosystems.

##### **Activities**

Data and research are required to improve the basic understanding of different types of ecosystems. Emphasis needs to be placed on studies of:

- Water movements;
- Seasonal cycles;
- Nutrient cycling;
- Sedimentology, geomorphology and cartography;
- Biological productivity;
- Physiology and behaviour of important organisms.

##### **Inputs**

Human, Financial and physical resources

##### **Short-term outputs**

Researchers trained, equipments and logistics provided, field work conducted, and data analysed.

##### **Potential Long-term outcome**

Research capacity of Institute of Marine Biology and Oceanography built.

**IMPLEMENTATION****Institutional Arrangements**

Following the work of various fishery experts under various programmes etc. It is suggested that the Institute of Marine Biology and Oceanography (IMBO), USL should be adequately staffed and equipped to carry out studies on the fishery of Sierra Leone. The Board of IMBO which comprises of members from various government ministries, university and NGOs will supervise the project.

**Risks and Barriers**

Inadequate human resources;  
 Insufficient financial resources;  
 Beaucratic barriers.

**Monitoring and evaluation**

The Board of The Institute of Marine Biology (IMBO) will monitor and evaluate the project.

**COST**

*USD 455,000*

**Budget Breakdown**

	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
Studies on water movements	30 000	20 000	15 000
Studies on Seasonal cycles	30 000	20 000	15 000
Studies on nutrient cycling	30 000	20 000	15 000
Studies on Sedimentology, geomorphology	30 000	20 000	15 000
Studies on Biological productivity	30 000	20 000	15 000
Studies on Physiology and behaviour of important organisms	30 000	20 000	15 000
Update on cartographic information	30 000	20 000	15 000

# SUDAN

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## NAPA PRIORITY PROJECT 3

### IMPROVING SUSTAINABLE AGRICULTURAL PRACTICES UNDER INCREASING HEAT-STRESS IN THE RIVER NILE STATE

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#### RATIONALE

The River Nile State is located in northern Sudan (desert, semi-desert zone), and covers an area of 124 km<sup>2</sup>. The State is transversed from south to north by the river Nile and its tributaries, River Atbra and number of seasonal streams. About 950,000 citizens inhabit the state with over 80% practicing agriculture (farmers and herders) as their main livelihood. Cultivated lands are concentrated around the River Nile and Atbra (banks and delta). Flood irrigation is concentrated mainly around the River Atbra. Farmers grow staples (sorghum and fodders) as well as economic crops (watermelon and vegetables). However, recently the annual rate (flow and water amount) of River Atbra has been decreasing, and this has led to the deterioration of crop and animal production. This is also exacerbated by land constraints as it has become difficult and costly to cultivate terraced land (i.e., far from river banks), which represents about 90% of the agricultural land.

Winter represents the basic agricultural season. In general, this season is characterized by being short and warm in Sudan. However, the River Nile State has relatively cold and long winters. Therefore, some winter crops are cultivated including wheat, legumes, vegetables, fruits, and spices. Currently, and for the past decade (1994-2005), significant increases in winter temperatures have been recorded mainly at the beginning and the end of the growing season. Consequently, the growing season has been shortened. Both the high temperature and the short growing season have a very negative impact on the productivity of winter crops.

The increase of temperature reduces growth of some crops (i.e., wheat), increases weeds, encourages pests and diseases (e.g. white fly, root rottenness), and reduces growing periods for seeds (poor quality). Given that cultivated agricultural land is quite limited, production decreases due to temperature changes have led to serious food shortages.

#### **Baseline Situation**

Large groups of local people (small scale, subsistence farmers) are dependent on agricultural production to meet basic needs as well as to generate limited household income. Indeed, most farmers are quite vulnerable, The NAPA assessment of vulnerability to climate change found that the most vulnerable are those who live in the area of the lower River Atbara. People there suffer from reduction of rainfall, which affects both the flow and amount of water carried by river Atbra. However, even in good rainy years, floodwaters have been found to cause a lot of damage and loss of lives and properties.

The increase in temperature during both winter and summer seasons adversely affect animal and crop production. As the state is part of the desert zone, they also suffer from high wind speed and shifting sand dunes that negatively affect the cultivated lands and cause blockage of irrigation channels. Due to climate change (scarcity rainfall, increase in temperature, drought) and desertification on one hand and due to lack of irrigation and storage facilities on the other hand, the cultivated area has

become very limited and that was found to have very negative effects on the stability of farmers who were forced to live on very meager resources or migrate to face major socio-economic and security problems. People cultivate limited areas around the riverbanks as well as terraced areas that surround the banks. While the cultivation of the former is practiced in very limited areas, the latter is very expensive to cultivate as it depends on both surface and ground water, which is subject to availability and high drilling costs. Accordingly, very few people are able to cope.

The increase in temperature has already caused reductions (some times failure) of winter-grown crop yields in the state. In very limited areas, improved varieties have been found to grow very well even under warmer condition. However, they were only grown on research farms.

#### **Climate Variability and Climate Change Problem**

With further increases in temperature, the shortening of the winter season, and further reduction/variability in rainfall, farmers in the region are likely not to be able to produce enough food, or they might face severe food gaps.

#### DESCRIPTION

##### **Goals and Objectives:**

The main goal of the proposed project is to reduce the vulnerability of farmers caused by the increase of temperature during the winter season. Within this broad goal, there are several major objectives as follows:

- Improve agricultural system practices of the targeted farmers;
- Maximize the utilization of flood water for irrigation of more agricultural lands in order to reduce the food gap;
- Control flood water to reduce its negative impact on people and to store water for agricultural and domestic and animal uses;
- Increase agricultural production and provision of solutions for socio-economic and security problems that arise due to loss of livelihoods and displacement.

##### **Project Activities**

The main activities will include:

- Introduction of heat resistant plant varieties and intensification of growing season (winter, summer, autumn) in order to reduce dependency on a single season (winter) and diversification of grown crops in each season to reduce risk of mono-cropping;
- Introduction of new economic crops such as sesame, sunflower, summer legumes, fodders etc.;
- Increase the cultivated area particularly in terraced area through improvement of irrigation, digging and cleaning of irrigation channels from the accumulated sand;
- Digging of water pools (hafirs) and wells for domestic and animal uses;
- Training and improvement of abilities of farmers through establishment of demonstration farms in order to raise their awareness regarding how to act when conditions changed;
- Establishment of rocky barriers to reduce wind speed and intensification of trees planting in villages and towns and along irrigation channels.

### Relation to current policies

The NAPA process facilitated the participation of stakeholders who represent different perspectives. Hence, the priority adaptation option reflects a consensus of stakeholders. The project is well linked to government policies and plans, being in line with ongoing strategies to raise agricultural productivity in the River Nile State.

### Expected Near-term Outcomes

The main outcomes expected from the proposed project include the following:

- Insurance of food security;
- Build up of resilience and adaptive capacity in order to help vulnerable communities meet the challenge of climate variability and climate change;
- Reduction of poverty;
- Reduce the negative impact desertification.

### Project Duration

The duration of the proposed project is 3 years.

### COST

The overall cost of the implementing the various activities of the project is:

*Estimated at USD 2,350,000*

A breakdown of major project costs is outlined below.

### **Budget for Improving sustainable agricultural practices under increasing heat-stress in the River Nile State**

<b>Activity</b>	<b>Year 1 (USD)</b>	<b>Year 2 (USD)</b>	<b>Year 3 (USD)</b>	<b>Total (USD)</b>
Introduction of heat-resistant varieties	40 000	45 000	50 000	135 000
Introduction of new crops	50 000	60 000	70 000	180 000
Improvement of irrigation digging and cleaning channels	75 000	215 000	255 000	545 000
Digging of water pools	75 000	225 000	259 000	559 000
Establishment of rocky barriers	75 000	100 000	125 000	300 000
Control of flood water	85 000	110 000	135 000	330 000
Training	36 000	37 000	38 000	111 000
Management	63 333	63 333	63 334	190 000
<b>Total</b>	<b>499 333</b>	<b>855 333</b>	<b>995 334</b>	<b>2 350 000</b>

# TANZANIA

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## NAPA PRIORITY PROJECT 1

### IMPROVING FOOD SECURITY IN DROUGHT-PRONE AREAS BY PROMOTING DROUGHT-TOLERANT CROPS

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#### RATIONALE/BACKGROUND

Shinyanga, Dodoma and Singida regions are top in the list of drought stricken areas of Tanzania. Recent crop surveys have revealed that rainfall shortage has become an outstanding cause of crop failure, and in effect recurrent food insecurity has become rampant in a number of regions and districts. It has been reported that although Tanzanian farmers have on average been able to actively feed 100% of the country's population per annum, pockets of food shortages continue to exist in 37 districts (nearly one third of all districts) in an average of 8 regions (MAFSC, 2006)<sup>2</sup>.

During the period (2001/02-2005/06), Tanzania was self-sufficient at different levels - the lowest level (88%) was recorded in 2003/04 while the highest (103%) was recorded in 2004/05. The lowest number of deficit regions (4) was recorded in 2002/03 while the largest number (14) was recorded in 2003/04. Over the same period the lowest number of districts showing pockets of food shortage (13) was recorded in 2002/03 while the highest number (62) was recorded in 2003/04. Currently 2006/07, while the country is 110% food self sufficient, 5 regions (50 districts) are earmarked as having pockets of food shortage.

These changes are particularly of interest when thinking of climate change causing a shift in agroecological zones thereby affecting crop calendar and performance. Understanding these changes is also important in understanding the poverty environment surrounding farmers' purchasing power, which is basically associated with management of food security at household level. Knowledge of these changes will also assist in policy decisions associated with improved management of agricultural practices as efforts are made towards raising farmers' income as a source of farmer incentive to invest towards increased productivity and production. It will also assist in appropriate policies to increase consumers' purchasing power and hence enhance everybody's food security.

In view of working towards these efforts it is hereby advocated that drought tolerant crops such as sorghum and millets may be most appropriate where adverse weather and degradation of soils are becoming an increasingly common feature. Consistent with this, deliberate efforts need to be made towards relocating agro-ecological zones, identifying appropriate crops for the zones, addressing water/moisture availability, and addressing fertilizer availability. The areas of failing agriculture which is probably attributed to negative effects of climate change include Shinyanga, Singida, Dodoma, Arusha, Tabora, Kilimanjaro and the northern part of Iringa region. If anything is to be done to address rampant and probably chronic food insecurity associated with negative effects of climate change these areas could provide an appropriate starting point.

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<sup>2</sup> Ministry of Agriculture Food Security and Cooperatives (2006), AGSTATS for Food Security (Table 5)

**DESCRIPTION****Objectives****General Objective**

To promote use of drought tolerant food crops in drought prone areas of Shinyanga, Dodoma and Singida regions for sustainable food production.

**Specific objectives**

To create awareness in local communities of the negative impacts of climate change on maize production.

To ensure production and supply of food to local communities in the drought-prone areas by replacing maize with the relevant drought tolerant crops.

**Activities**

Creating awareness of the negative impacts of climate change to local communities;

Identification of suitable crops to climate change induced AEZ;

Capacity building in terms of acquisition of typical crop varieties, input package, market availability and utilization of drought tolerant crops;

Enhancing extension services relevant to the identified drought tolerant crops.

**IMPLEMENTATION****Inputs**

Human resources, financial resources and materials.

**Institutional arrangement**

The Project will be implemented under the leadership of Ministry of Agriculture and Food Security in collaboration with Local Government Authority, Tanzania Meteorology Authority, local communities, NGOs and CBOs.

**COST****Activity-Indicative Budget**

<i>Total cost: USD 8,500,000</i>
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<b>Activity</b>	<b>Year 1 (USD)</b>	<b>Year 2 (USD)</b>	<b>Year 3 (USD)</b>	<b>Total (USD)</b>
Project Planning and Appraisal	900 000			900 000
Farmer training and facilitation	1 800 000	900 000	900 000	3 600 000
Extension services and facilitation	1 200 000	800 000	800 000	2 800 000
Public outreach	400 000	400 000	400 000	1 200 000
<b>TOTAL</b>	<b>4 300 000</b>	<b>2 100 000</b>	<b>2 100 000</b>	<b>8 500 000</b>

# TUVALU

## NAPA PRIORITY PROJECT 2

### INCREASING SUBSISTENCE OF PIT GROWN PULAKA PRODUCTIVITY THROUGH INTRODUCTION OF A SALT-TOLERANT PULAKA SPECIES

#### RATIONALE

The vulnerability of subsistence agriculture in Tuvalu, as highlighted in section 3.3.4 of the NAPA, clearly defines the cause of the shift to a more cash based way of livelihood. A rapid assessment by the agricultural department shows that the level of destruction caused by saltwater intrusion due to sea level rise on pulaka plantations is approximately 60%, and the remaining 40% of pulaka plantations remain highly sensitive to future saltwater intrusion, see Tables 10 and 11 (of NAPA). It was assumed that an absolute destruction to pulaka crops is imminent in the near future for all islands of Tuvalu – possibly in the next decade unless urgent and immediate mitigation measures are implemented. The worst-case scenario is that an absolute destruction to pulaka crop will divert the dependence of the people of Tuvalu on imported foods, thus, an exposure of low-income families to absolute poverty. Therefore, to reduce risks of an absolute destruction of pulaka crop and prevent abrupt shift of Tuvalu’s dependence on imported food, it is necessary to introduce a salt-tolerant pulaka species in the region (preferably the Palau pulaka species).

#### DESCRIPTION

##### Goal

Increasing Pulaka Productivity in Tuvalu.

##### Objectives

There are three objectives for this project:

- Increase number of abandoned pulaka pit re-planted;
- People’s preference for fresh nutritious pulaka increased.

<b>Outcomes:</b>	<b>Activities:</b>	<b>Inputs:</b>
1. Enhance pulaka productivity	<b>Activities will include:</b> Planning field work and logistics; Transfer and Establishment of salt-tolerant pulaka nursery; Dissemination of salt-tolerant pulaka to all islands.	Human labour Financial resources Agricultural expert Tool and equipment
2. Local Farmers trained	<b>Activities will include:</b> Training of local farmers on: Maintaining salt-tolerant pulaka nursery Planting salt-tolerant species Preparation and printing of training manual Training local officials on monitoring	Tools and equipment Agricultural expert Financial resources
3. Improved health	<b>Activities will include:</b> Training of locals on cooking the salt-tolerant pulaka; Promote eating locally grown nutritious food.	Financial Resources



**Short-term outputs:**

Abandoned pulaka pits planted;  
 Reduced unproductive lands;  
 Biodiversity enhanced.

**Prospective Long-term outputs:**

Increase of fresh and nutritious local food;  
 Enhanced food security;  
 Local farmers trained;  
 Decreasing trend of lifestyle disease;  
 Decrease in percentage of abandoned pit gardens.

**IMPLEMENTATION****Institutional arrangements**

Primary Executing Agencies: Department of Agriculture and Kaupule.

Secondary executing Agencies: DOE, DOLS, Department of Rural Development (DRD), NGOs and CBOs.

**Risks and Barriers**

The risks for this project are:

Actual capability of the selected salt-tolerant pulaka to grow in environmental conditions and parameters of pulaka pits in Tuvalu is not known - only assumptions made;

Low possibility that the salt-tolerant pulaka will be the preferred family staple compared to rice;

Introduction of new pest is a possibility.

**Monitoring and Evaluation**

Monitoring will be done by the Department of Agriculture and the Department of Environment. The Project Steering Committee will evaluate performances on a quarterly basis through convened meetings on the progress of the project activity implementation and expenditure of project funds.

**COST**

The total cost for this project is:

*USD 2,220,000*

**Budget Breakdown**

An indicative and tentative financial resource estimate for the activities is provided below:

<b>Activities</b>	<b>Year 1 (USD)</b>	<b>Year 2 (USD)</b>	<b>Year 3 (USD)</b>
Planning field work and logistics	30 000	30 000	30 000
Training of local farmers on planting salt-tolerant pulaka/local cash crop and maintaining the salt-tolerant pulaka/local cash crop nursery	35 000	35 000	

Introduction and establishment of salt-tolerant pulaka/local cash crop nurseries	50 000	35 000	25 000
Local Dissemination and planting of salt-tolerant pulaka/local cash crop to other islands	800 000	600 000	500 000
Monitoring	5 000	5 000	5 000
Printing training manual	10 000	5 000	
Local Promotion and advocacy	5 000	5 000	5 000
Contingencies	2 000	2 000	1 000
<b>Sub-total</b>	<b>927 000</b>	<b>722 000</b>	<b>571 000</b>
<b>Gross Total</b>			<b>2 220 000</b>

# VANUATU

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## NAPA PRIORITY PROJECT 1

### PROJECT CONCEPT 1. AGRICULTURE & FOOD SECURITY

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#### PROJECT GOAL

The overall goal of the project is to enhance food security and hence resilience of the economy to the adverse effects of climate change.

#### RATIONALE

Low productivity and small holdings are the key constraints towards expansion and commercialization of agriculture in Vanuatu. There is little incentive to enhance productivity through use of modern methods and technology. The sector is also vulnerable to change in world prices. Copra and cocoa are the main commodities that have been affected by this to a large degree. Soil degradation is also affecting production. The traditional method of shifting cultivation is no longer practical given the increased demand for land from the rising population. Agro-forestry is being promoted, with the use of intercropping to reduce soil degradation, but its impact has been limited.

The increasing incidence of extreme events and climate change is adding to the stress on this sector. There is little additional information on the effect these changes will have on the other cash crops such as yams, taro and sweet potatoes that are important for the sustenance of the Ni-Vanutu people. The issue is further complicated by the lack of mechanisms to enhance storage to meet shortfalls during times of disasters. Climate related disasters are already impacting production through salt water intrusion, droughts, soil erosion and cyclones. The projected increase in cyclone frequency and intensity further heightens the vulnerability of the agriculture sector. Destructive winds and heavy rainfall associated with cyclone events may result in widespread crop damage.

Crop production has decreased significantly as a result of increased temperatures, more frequent and prolonged dry conditions and increased variability of rainfall. Pest activities have also increased with yams being the crop most affected by a tuba-eating beetle that induces rotting. Cyclone incidences however remain the major threat to the sector often severely damaging subsistence crops.

Annual average temperatures are projected to increase to 28.8 °C and 29.7 °C by 2050 and 2080 respectively under the selected climate change scenarios. With these projected elevation in temperatures, heat tolerance thresholds of crops are likely to be reached and most likely induce heat stress, wilting and crop failure. Subsistence crop production may fall as a result and in turn threaten food security on the island. Impacts may be aggravated in the event of El Nino episodes, which are expected to cause extreme dry spells in future. Furthermore, in a warmer environment, people will be forced to reduce working hours to the early hours of the morning and the cooler hours of the afternoon and early evenings, hence reducing productivity.

Increased precipitation scenarios may increase annual averages by 2001 mm by the 2050s and 280 mm by the 2080s. Prolonged wet conditions and warmer temperatures may create conditions favourable for pests and diseases, which may flourish and affect production and food security significantly.

Traditionally through a system of bartering, and shifting agriculture the people have managed to deal with these events. However, given the shortage of land and the increased incidence of these events, these mechanisms are no longer adequate. There have been some methods that have been employed to enhance storage and processing, and it is expected that this project will explore ways of adopting these for use throughout the country.

One of the successful practices that has been adopted in certain areas has been the use of a simple process for drying and preserving cassava – an important source of food for most rural communities. This is briefly illustrated below.

#### **Making of Portable Drying Frame for Cassava Chips**

Recommended structure is a (200 x 91) cm frame on which is stretched some chicken wire covered by some mosquito net. These frames allow for the drying of up to 12 kg of fresh cassava over two to three sunny days.



**1. Cutting the chicken wire on the frame**



**2. Stretching the chicken wire on the frame**



**3. Organising a support for the frame  
Driers being used**



**4. Cutting some chips**

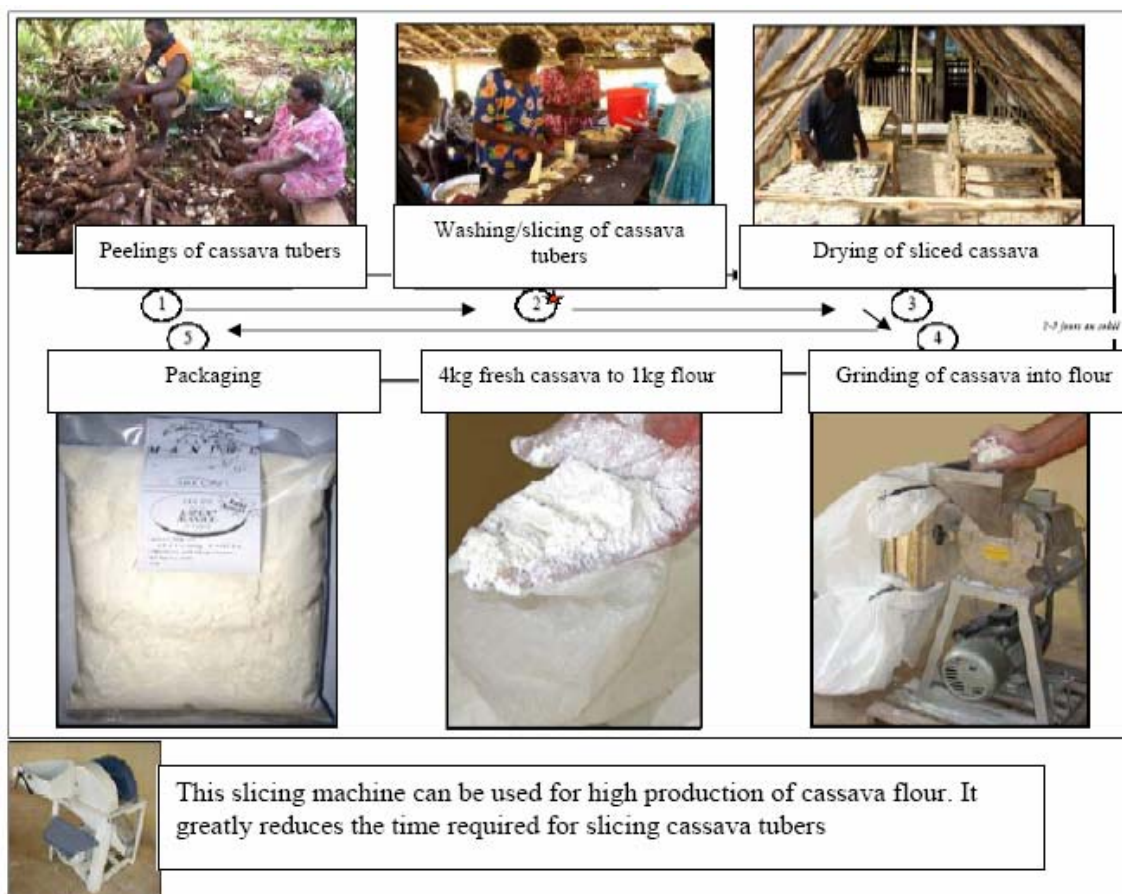


**5.**



## 6. A readily available dryer area.

### Illustrated Transformation of Fresh Cassava Into Flour



Since its inception in 2002 POPACA, the EU and Government of France have supported the country's root crop sector through rural development projects being implemented by the Department of Agriculture and Rural Development

A Root Crop Development Programme was initiated three years ago on the Island of Santo focusing on the implementation of village based manioc processing, One producer organization was created the Lory Cooperative, and equipped with milling equipment for the production of manioc flour.

The consumption of local products was promoted through assistance to an "Aelan kakai (Year of Island Food) stall" at Luganville, run by local women's groups, who

organized local training sessions on creating wholesome food using manioc flour as a main ingredient. The Santo Programme “Flawa Blong Manioc”(Manioc flour) demonstrated that appropriate technology was readily available for the production of manioc flour in Vanuatu. Experimentation demonstrated that it is possible to develop a market for manioc flour products by its incorporation into traditionally ‘wheat flour only’ products.

Furthermore, the Santo “Flawa Blong Manioc” Programme ventured into adapting local popular recipes such as laplap using manioc flour instead of more traditional ingredients, and produced a recipe booklet in Bislama which also provided numerous other cooking suggestions. However, one of the major problems the programme encountered in Santo was the limited size of the local market.

Consequently, it was decided in 2004 to expand POPACA’s Root Crop Programme to Efaté, where it is hoped that the country’s capital and largest urban centre will offer much greater and diverse market opportunities.

In February 2005, the Department of Agriculture, through **POPACA**, launched a root crop processing pilot project in the villages of North Efaté and, to date, information meetings, survey, training sessions, and workshops have been organised at Magaliliu, Tanoliu, and Malafau. In excess of thirty farmers have been involved in the preliminary stage of the project and are successfully participating in activities organized by the Programme; they have also received drying equipment from POPACA.

In June 2005 an implementation agreement was signed between the Government of Vanuatu and the FAO (Food and Agriculture Organization).

The cassava flawa program has been taken up under the Italian Trust Fund implemented by FAO (Food and Agriculture Organization) under “SUPPORT TO THE REGIONAL PROGRAMME FOR FOOD SECURITY (RPFS) IN THE PACIFIC ISLAND COUNTRIES

The primary overall objective of the root crop processing project is to enhance farmers’ livelihoods, incomes and food security.

The project will enable the general development of a greater consumption of locally grown products and more specifically will supply the Port Vila urban market. Other objective expected is to reduce the country’s reliance on imported foods and to strengthen technical support to root crop producers.

The development program complies as well with a current policy on improving the level of food security in the country.

The project is aimed at facilitating the setting up of root Crops Processing Units on Villages around the island of Efaté. Only one PU is built at Onesua College (EFATE) due to limited funding. There is processing equipment in three villages around the Island: Teouma, Magaliliu, Tanoliu.

In 2006 three workshops was organized in different villages on the island .The purpose of these trainings was to raise awareness on household food security issues such as local food processing and consumption, and also to promote food preservation as a disaster preparedness. More than one hundred participants attend these sessions that was conducted in collaboration with Agriculture, Trade and Public Health Departments. It is expected that more trainings will be organized in communities in 2007 on EFATE.

It is imperative that these training sessions, and awareness programmes be extended to other parts of the country. The rapid population growth, land shortage and the projected impacts of climate change makes the case for the food preservation programs a necessity.

#### **Project Objective**

- To facilitate alternative methods of food preservation, processing and marketing by incorporating successful traditional practices with the modern technological methods;
- Develop capacity of local and national governmental and non-governmental organizations to support vulnerable communities in coping with climate variability and longer-term climate change;
- To sensitise communities and decision makers on the potential impacts of climate change on food security.

#### **Outcome 1**

Alternative method of food preservation taking into account traditional and modern practices.

##### **Outputs**

- 1.1 Existing technology upgraded;
- 1.2 Particular processing technology tried and tested in other sites and provinces;
- 1.2 Particular preservation technology tried and tested in sites and provinces;
- 1.3 Technology replicated in other identified sites and provinces;
- 1.4 Use of local flour from root crops such as cassava, yams, sweet potatoes etc is enhanced.

#### **Outcome 2**

Alternative method of food processing and marketing strategies.

##### **Outputs**

- 1.1 Marketing strategies: product analysis, packaging, labelling adopted at existing sites;
- 1.2 Strategies extended to other sites and provinces;
- 1.3 Training activities on marketing activities be conducted for communities.

#### **Outcome 3**

Raised awareness and enhanced capacity to communicate information more effectively between different sectors and stakeholders.

##### **Outputs**

- 1.1 Enhanced knowledge about the techniques/processes and technology;
- 1.2 Greater awareness about food storage as a strategy to meet shortfalls during times of disasters;
- 1.3 Communities better informed about alternative marketing strategies.

#### **IMPLEMENTATION ARRANGEMENTS**

The project will be implemented by the Department of Agriculture and Rural Development (DARD) under the Technical Section. The DARD will work closely with other government agencies such as the Department of Health Food Technology Centre, Department of Forestry and Vanuatu Quarantine & Inspection Services. The

project will be under the broad overview of NACCC which will serve as the Advisory Committee.

**Sustainability of the program.**

Food security aspect is one of the major activities that the Department of Agriculture with the other government sector are supporting and implementing since the year 2000.

To assure the sustainability of this program the Department of Agriculture will support all activities at the field level, logistic during the implementation of the food preservation program to achieve its vision.

Furthermore this institution will emphasize that the participation of all stakeholders including small-holder, farmers, youth and women associations, working together for the mutual benefit of rural livelihoods is essential for the Programme to succeed.

**BUDGET**

It is expected that the GEF will be requested to provide **USD 1m** from the LDC fund for the proposed Medium Size Project. An equivalent amount of co-funding will be provided through the FAO and EU projects, and in-kind support from the Government.



**ZAMBIA**

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**NAPA PRIORITY PROJECT 2**

**APPENDIX II: NAPA OPTION 3**

**PROMOTION OF ALTERNATIVES SOURCES OF LIVELIHOODS TO  
REDUCE VULNERABILITY TO CLIMATE CHANGE/VARIABILITY  
TO COMMUNITIES LIVING AROUND GMAS**

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**RATIONALE/JUSTIFICATION**

Climate change will adversely affect the livelihoods of resource-poor rural communities. These are communities experiencing extreme poverty and constitute the most vulnerable groups. The promotion of alternative livelihood sources will contribute to improving community resilience to climate change on their livelihoods through the growth of diverse sources of alternative cash income.

**DESCRIPTION**

**Overall Objective**

To initiate alternative livelihood sources for communities in and around protected areas.

**Activities**

Promotion of Income-Generating Activities (IGA) and other alternative livelihood sources;  
Setting up micro credit facilities targeting women beneficiaries;  
Establishment of household woodlots for firewood/poles/timbers.

**Inputs**

Community based Organizations (CBOs), ZAWA and local communities will play the most important roles;  
Financial institutions, Cooperatives and women's clubs.

**Potential Long-Term Outputs/Outcomes**

Increased alternative sources of livelihood around national parks and GMAs

**IMPLEMENTATION**

**Institutional Arrangement**

MTENR in conjunction with ZAWA and CBO will have to again play a major in ensuring that communities are encouraged to participate.

**Risks and Barriers**

- If communities are not willing to engage in alternative livelihood sources;
- Government unwillingness to guarantee revolving credit fund and unwillingness of community of women to participate;
- Communities unwillingness to participate in the programme.

**COST**

<i>USD 175,000</i>
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# ZAMBIA

## NAPA PRIORITY PROJECT 6

### APPENDIX II: NAPA OPTION 6

#### ADAPTATION OF LAND USE PRACTICES (CROPS, FISH, AND LIVESTOCK) IN LIGHT OF CLIMATE CHANGE

##### RATIONALE/JUSTIFICATION

Poverty in Zambia is wide spread, with 73% of the population living below poverty. Over 60% of Zambians live in rural areas, with the majority depending on subsistence rain-fed agriculture, and relying on a single maize harvest for their livelihoods. This makes them very vulnerable to climate related natural calamities and disasters, such as floods and droughts, which directly affect agricultural productivity. The current agricultural practices used are no longer sustainable in the face of the limitations imposed by climate change, and there is urgent need for adaptation to avoid food insecurity, malnutrition diseases and worsening of people living with HIV.

The integrated sustainable livelihood project would enhance people's capacity to cope with and adapt to these natural calamities in vulnerable areas. The major sustainable livelihood interventions for coping with these natural calamities include the promotion of the following; water management, crop and livestock production, growing of crop varieties and fruit trees and rearing of animal breeds that are drought tolerant, using agro-forestry practices, fish farming and processing, market access and cross cutting issues such HIV/AIDS, gender and the environment.

##### DESCRIPTION

##### **Overall Objectives**

To enhance awareness and training among stakeholders;

To enhance improved food security, income generation and business opportunities in all agricultural sectors;

To identify species best suitable for aquaculture under changing climatic conditions due to global warming.

##### **Activities**

- Development of dissemination and training materials on land use practices;
- Review of the National Agriculture Policy;
- Creating awareness about the new land use practices through workshops and seminars;
- Training on new land use practices;
- Introduction of sound Land Use Planning;
- Introduction of crops that are more suitable to the changing climate pattern;
- Conduct fish farming trials in each catchment area and agro-ecological zone;
- Identify species suitable for aquaculture in each area;
- Assess the impact of extreme variations in precipitation on aquaculture systems;
- Monitoring and evaluation.

##### **Inputs**

Research materials, human and financial resources will be required.

**Short-Term Outputs**

Training materials available, communities sensitized and talking about the new policy, communities sensitized and talking about the new practices, practice by communities, presence of executing personnel, Number of fish farming trials undertaken.

Number of areas, stations and agro ecological zones where species have been identified, Number of fish farming systems available and adopted.

**Potential Long-Term Outputs/Outcomes**

Achievement of food security through the adoption of agriculture practices and crop/livestock choices that are more suitable to the changing availability of natural resources.

Environmental benefit, with a sustainable natural resource management, adapted to new conditions imposed by climate change.

**IMPLEMENTATION****Institutional Arrangement**

The key institutions will be MACO, ZNFU, Traditional leaders, consultants and key informants in communities.

**Risks and Barriers**

- Information not readily available to be converted into appropriate agricultural materials;
- No Government support in terms of policy changes, and communities not responding positively.

**COST**

<i>USD 1,200,000</i>
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