



NATIONAL ADAPTATION PROGRAMMES OF ACTION

Summary of Cross Sectoral Projects Identified in Submitted NAPAs as of September 2008

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BANGLADESH

NAPA PRIORITY PROJECT No 5

CONSTRUCTION OF FLOOD SHELTER, AND INFORMATION AND ASSISTANCE CENTRE TO COPE WITH ENHANCED RECURRENT FLOODS IN MAJOR FLOODPLAINS

TYPE OF PROJECT

Intervention (with policy and awareness raising elements)

ACTIVITIES

Construction of Multipurpose Cyclone – Flood Shelters in High Vulnerable Areas

RATIONALE

Coastal areas are vulnerable to cyclones and storm surges. Heavy wind and sea water destroy houses and properties. Lives are lost in remote coastal areas due to the absence of shelters. To protect people and livestock from cyclones and cyclone induced floods, suitable shelters are required for people and their livestock. The rest of the time when there are no natural disasters, these shelters can be used as schools, community centers, or for other purposes.

With the projected Sea Level Rise, the height of the shelters may prove to be inadequate. The shelters may need to be redesigned and strengthened in order to incorporate climate change considerations.

DESCRIPTION

Objectives and activities

- Increase the height and strengthening proposed shelters from climate change induced hazards

Inputs

- Reviewing existing condition of cyclone shelters;
- Improvement of design criteria in context of climate change;
- Adoption of new criteria in construction of new shelters;
- Experts of Disaster Management;
- Engineers for designing shelters.

Short-term outputs

- Shelters for vulnerable people in cyclone prone remote coastal area.

Potential long-term outcomes

- Safety of life from climate change induced cyclone and flood;
- Improvement of disaster management system.

IMPLEMENTATION

Institutional arrangement

Primary implementing Agency: DMB, LGED

Secondary implementing Agencies: BMD, BWDB

Risks and barriers

- Non-availability of fund;
- Proper utilization of shelters;
- Proper construction of shelters.

Evaluation and monitoring

- A committee formed by MoFDM.

COST

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

Full project: USD 5,000,000

Project design: USD 50,000

BANGLADESH

NAPA PRIORITY PROJECT No 6

MAINSTREAMING ADAPTATION TO CLIMATE CHANGE INTO POLICIES AND PROGRAMMES IN DIFFERENT SECTORS (FOCUSING ON DISASTER MANAGEMENT, WATER, AGRICULTURE, HEALTH AND INDUSTRY)

TYPE OF PROJECT

Capacity building (with awareness raising, policy and research elements).

RATIONALE

Many of the key sectors (such as disaster management, water, agriculture, health and industry) are vulnerable to climate change impacts and need to include such potential impacts in their sectoral design and investments.

DESCRIPTION

Objectives and activities

To mainstream climate change impact assessment (and adaptation) into sectoral planning and policy in the disaster management, water, agriculture, health and industry sectors .

Inputs and Activities

- Climate change and sectoral experts to advise sectoral;
- Planners and policy makers on the ways of incorporating and mainstreaming climate change impacts into sectoral plans and policies.

Short-term outputs

Greater awareness of climate change issues and their importance in sectoral planning and policies.

Potential long-term outcomes

Mainstreaming of climate change impacts (and adaptation) into sectoral plans and policies.

IMPLEMENTATION

Institutional arrangement

Primary implementing agency: DOE

Secondary implementing agencies: WARPO, FD, DOF, BARC, Universities,

Risks and barriers

Lack of understanding and awareness of the climate change issues within the sectoral agencies.

COST

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

Full project: USD 1 million

Design phase: USD 25,000

BENIN

NAPA PRIORITY PROJECT 1

P1-SECTEURS: AGRICULTURE- SECURITE ALIMENTAIRE

MISE EN PLACE D'UN SYSTÈME DE PRÉVISION DE RISQUES CLIMATIQUES ET D'ALERTE RAPIDE POUR LA SÉCURITÉ ALIMENTAIRE DANS 4 ZONES AGROÉCOLOGIQUES VULNÉRABLES¹

OBJECTIF GENERAL

Mettre à la disposition des acteurs et des communautés agricoles des avis et des alertes en cas d'événements météorologiques et climatologiques significatifs annoncés, dommageables aux systèmes de production.

CONTEXTE ET JUSTIFICATION

Les principaux risques climatiques identifiés sur le territoire de la République du Bénin sont la sécheresse, les inondations et l'avancée de la mer/l'érosion côtière. Leurs impacts sont très importants et se caractérisent par une dégradation des ressources naturelles, le déplacement des populations, les perturbations des activités économiques surtout agricoles et des coûts économiques et sociaux de plus en plus lourds alors que l'agriculture constitue l'activité principale de 70% de la population active et contribue pour 36% du PIB et 88% des recettes d'exportation à hauteur de 15% aux recettes de l'Etat.

Les pluies du début de saison pluvieuse sont violentes, atteignant fréquemment une intensité supérieure à 100mm/h ce qui favorise l'inondation et l'érosion sur les sols mal protégés avec des pertes de semailles/récoltes. Dans les études de vulnérabilité réalisées au Bénin en 2001 (CNI/MEHU, 2001), les perspectives font état d'une réduction des précipitations de l'ordre de 20 à 30% au niveau national ceci se traduit par la réduction de 40-60% de disponibilité des ressources en eau. Aussi, faudra t-il préciser que les pluies diluviennes des dernières années ont contribué à l'inondation des populations et à la perte de semailles dans plusieurs zones avec des pertes en vies humaines.

En matière de prévention des risques climatiques, le Bénin ne dispose d'aucun mécanisme particulier. Le système national d'observation du climat dans le pays est vétuste et ne renferme qu'une centaine de stations d'observations dominées par des postes pluviométriques et une trentaine de stations hydrométriques notamment dans le Sud-Est et le Nord-Est du Bénin, et un système de réception d'images satellitaires MSG (Meteosat de Seconde Génération).

Pour corriger ces insuffisances et permettre aux populations exposées aux risques climatiques et aux communautés rurales de prendre les mesures palliatives qu'appellent les situations extrêmes, de mieux gérer les ressources en eau disponible et les sols cultivables, il devient urgent d'améliorer le système national d'observation du climat, d'investir dans la mise en place d'un système d'alerte précoce et promouvoir des systèmes appropriés de production agricole d'adaptation aux changements climatiques pour la sécurité alimentaire et nutritionnelle dans les zones agroécologiques les plus exposées aux risques climatiques à savoir : l'extrême nord

¹ Extrême nord Bénin, Ouest Atacora-Nord Donga, Zone cotonnière du Centre et Zone des pêcheries.

Bénin, l'Ouest Atacora – nord Donga, la zone cotonnière du Centre et la zone des pêcheries.

Le Bénin, a, grâce à la coopération bénino-allemande, bénéficié d'un projet pilote d'adaptation aux changements climatiques à travers la gestion durable des bassins versants dans l'Ouest Atacora et nord Donga. Les acquis de ce projet seront capitalisés dans la mise en oeuvre du présent projet. Les secteurs prioritaires concernés sont, entre autres, l'agriculture et les ressources en eau.

DESCRIPTION

Localisation

Le présent projet intéresse particulièrement les zones agro écologiques les plus exposées aux risques climatiques. Il s'agit de l'extrême nord Bénin, l'Ouest Atacora – nord Donga, la zone cotonnière du Centre et la zone des pêcheries.

Groupes bénéficiaires (structures d'appui, formation)

Les groupes bénéficiaires sont : exploitants agricoles ; éleveurs ; pêcheurs ; populations riveraines des cours d'eau et des plans d'eau ; populations de la zone côtière.

Objectif global

Mettre à la disposition des acteurs et des communautés agricoles des avis et des alertes en cas d'événements météorologiques et climatologiques significatifs annoncés, dommageables aux systèmes de production.

Objectifs spécifiques

Objectifs spécifiques	Activités	Plan de financement (USD)
O1 Renforcer les capacités nationales d'acquisition de données sur l'ensemble des paramètres météorologiques, climatologiques et phénologiques, nécessaires à la surveillance continue du climat et au suivi de la campagne agricole	Renforcement des capacités des personnels des directions techniques concernées en matière de préparation intellectuelle, d'organisation et de gestion du système d'alerte rapide (missions d'information dans la sous-région, formations, etc.)	50 000
	Amélioration des modèles d'analyse et de prévision existants	100 000
	Renouvellement les équipements vétustes et obsolètes au niveau des stations climatologiques et synoptiques existants, y compris les systèmes de communication	1 080 000
	Transformation des postes pluviométriques des chefs-lieux des Communes les plus exposées aux risques climatiques en stations climatologiques ou agro-météorologiques (8)	1 000 000
O2 Fournir aux acteurs et communautés rurales des informations sur les événements météorologiques et climatologiques extrêmes futurs, susceptibles de causer des dommages dans les systèmes d'exploitation	Création d'un mécanisme institutionnel de coordination et de gestion des composantes du système d'alerte rapide (acquisition et analyse des données, préparation des avis ou des alertes, diffusion, intervention d'appui, etc.)	200 000
	Renforcement des capacités des populations et des exploitants agricoles des zones agroécologiques les plus exposées aux risques climatiques en matière de réaction rapide face aux risques annoncés	200 000

agricoles	Rodage du mécanisme de coordination et de gestion du système d'alerte rapide sur les modèles d'analyse et de prévision existants	50 000
	Installation d'un radar météorologique de détection et de surveillance des phénomènes météorologiques significatifs	2 600 000
	Extension du réseau actuel de six (6) stations synoptiques	1 000 000
O3 Promouvoir des systèmes appropriés de production agricole d'adaptation aux changements climatiques pour la sécurité alimentaire et nutritionnelle	Promotion des techniques culturales améliorées et adaptées aux changements climatiques	800 000
	Promotion des activités de contre-saison	600 000
	Sensibiliser les populations sur les impacts négatifs des changements climatiques sur les ressources des bassins versants et les activités humaines	100 000
O4 Coordonner et gérer le Coordonation et Gestion		310 000
	Suivi et évaluation	100 000
Total		8 190 000

Sources

LDCF 27,3% (USD 3,000,000) ; Cofinancement 62,7% (USD 5,190,000) (Budget National, coopération bilatérale et multilatérale, populations bénéficiaires) soit un total de USD 8,190,000.

Des dispositions sont prises en vue du renouvellement des équipements vétustes sur financement du Budget National, pour un montant de USD 230.000 (DMN).

Les images satellitaires disponibles aujourd'hui seront utilisées pour faciliter les prévisions. Le pays exploitera la possibilité d'acquisition de radar météorologique à travers le programme AMMA.

Le financement total recherché est de USD 2.360.000.

Impacts

Les informations fournies aux organisations professionnelles agricoles par le système d'alerte rapide permettent aux exploitants d'anticiper les dispositions pratiques à prendre pour assurer la protection des cultures, des récoltes et des troupeaux avant la manifestation des effets néfastes des perturbations annoncées. Il s'en suit:

- une production agricole accrue;
- des pertes de récoltes et d'animaux évitées;
- la sécurité économique des exploitants mieux assurée;
- la sécurité alimentaire de la communauté mieux assurée.

MISE EN OEUVRE ET EXECUTION

Ancrage institutionnel du projet

- Agence de mise en oeuvre : Direction Générale de l'Environnement;
- Agence d'exécution : Direction Nationale de la Météorologie conjointement avec l'ASECNA, la Direction de l'Agriculture, Direction Générale de l'Eau;
- Comité de pilotage: Ministères impliqués (Ministères en charge du Développement, des Transports, de l'Agriculture, de l'Environnement, de l'Intérieur, de la Communication, en charge des ressources en eau, membres Comité National sur les Changements Climatiques, Collectivités locales concernées.

Risques et obstacles

- Coût élevé des équipements et de leur maintenance;
- Modification de l'environnement des stations d'observation;
- Insuffisance de ressources humaines qualifiées;
- Lourdeur administrative;
- Retard dans le décaissement des fonds.

Suivi et évaluation

Indicateurs		Mécanisme
D'exécution	D'Impacts	
Nombre et type d'équipements acquis	Nombre de personnes écoutant les infos	Evaluation initiale
Stations pluviométriques érigées en stations climatologiques ou agrométéorologiques	Nombre de parution et numéros d'articles	Tournées d'installation des équipements
Nombre de stations climatologiques renforcées	Efficacité du système d'alerte d'au moins à 60%	Tournées d'inspection et d'évaluation
Nombre de stations dont l'emplacement ne répond plus aux normes environnementales réaménagées ou déplacées		Rapport sur l'état de fonctionnement et le degré de performance des équipements
Nombre de nouvelles stations synoptiques créées		Rapport sur l'Efficacité du système d'alerte
Mécanismes du système de prévision de risques climatiques et d'alerte rapide mis en place		Evaluation à mi – parcours
Disponibilité de base de données		Evaluation finale du projet.
Avis et alerte émis		
Fréquence des réunions des organes de suivi		

Durée du projet

6 ans

COÛT

USD 8,190,000

DJIBOUTI

NAPA PRIORITY PROJECT NO. 1

RÉDUCTION DES RISQUES LIÉS AU CHANGEMENT CLIMATIQUE POUR LES SYSTÈMES DE PRODUCTION DES ZONES CÔTIÈRES À TRAVERS UNE GESTION INTÉGRÉE, ADAPTÉE ET PARTICIPATIVE AVEC LES ORGANISATIONS COMMUNAUTAIRES

BUT

Réduire la vulnérabilité de Khor Angar et Atar-Damerjog aux changements et variabilité climatiques à travers l'approche développée dans les chapitres et sections qui suivent.

DESCRIPTION DE LA SITUATION ACTUELLE DU SITE DE PROJET

Contexte physique de la zone du projet

De part sa situation géographique, la République de Djibouti possède un littoral de 372 km de long qui forme avec les terres situées à 15 Km de rayon des rivages les zones côtières, constituées par des plaines sédimentaires littorales dans leurs extrémités nord et sud, ainsi que par des massifs montagneux au centre qui dominent le littoral. Les zones côtières sont occupées par une végétation de steppe arbustive avec des espèces dominantes selon les secteurs et abritent des écosystèmes (mangroves et récifs coralliens) en voie de dégradation qui servent de derniers refuges naturels à une vie en symbiose de l'homme et la nature dans sa riche biodiversité.

Deux sites du même projet sont situés aux deux extrémités du littoral djiboutien, à Khor Angar (district d'Obock) et à Atar-Damerjog (district d'Arta), pour entreprendre des activités pilotes d'adaptation répondant au besoin urgent et immédiat de restauration d'un écosystème côtier dans un état avancé de dégradation et où les populations et leurs moyens de subsistance sont sous une pression et menace de plus en plus aigues des effets pervers des changements et variabilités climatiques.

Situé à l'extrémité nord du pays à 50 km de la frontière Erythréenne, Khor Angar est situé sur une plaine littorale à proximité immédiate de la mer qui fait face au Yémen. Une galerie forestière de palétuviers, très dégradée et formant un tapis épais de branchages morts, domine le relief et empêche les graines mûres d'atteindre le sol pour assurer une régénération naturelle de la mangrove. La végétation est alimentée par un bras de la Mer Rouge en cours d'ensablement avancé, affaiblissant progressivement le débit d'alimentation en eau de mer de l'extrémité sud de la galerie. Les faibles précipitations observées, si elles permettent difficilement le développement normal des palétuviers, ne sont pas du tout suffisantes pour l'alimentation en eau des populations locales.

Situé sur la plaine littorale au sud de la capitale, le site d'Atar-Damerjog est couvert en partie par une végétation d'acacias utilisée par les communautés locales comme bois de chauffe. Les zones de parcours pour l'élevage transhumant sont très dégradées par une forte concentration du bétail. Le site se situe dans la zone de la nappe d'eau d'alimentation de la capitale (à 7 km de Djibouti ville). Atar-Damerjog se trouve précisément entre la mer et le site des forages de production.

La situation socioéconomique de la zone du projet

Khor Angar

Le village de Khor Angar, composé de quelques édifices publics, des écoles et une dizaine d'abris familiaux construits avec des matériaux de récupération s'étend à quelques centaines de mètres de la forêt comme des guetteurs vigilants et jaloux de la ressource dont ils tirent l'essentiel de leurs subsistances. Quelques 80 familles, pauvres et assoiffées, habitent le village. L'ensemble des hameaux environnants (Ras-Syan, Awoia, Gaherré) rattachés au village regroupe une population d'un millier de personnes composée de pêcheurs et d'éleveurs affaiblis par le conflit armé qu'a connu le pays entre 1991 et 1994. Le bétail, constitué environ 2000 chameaux et de 4000 ovins/caprins affaiblis, vit notamment du pâturage aérien de la forêt de palétuviers.

Atar-Damerjog

La population sédentaire et semi sédentaire de la zone Atar-Damerjog est environ 4500 personnes composée de commerçants, de pêcheurs, d'agriculteurs et d'éleveurs. La zone, située dans une région frontalière sud où il y a un important axe de circulation et d'échanges commerciaux entre Djibouti et la Somalie, constituait jadis la principale source d'approvisionnement en légumes frais de la capitale. A proximité du village de Damerjog (2 km) dans la partie dégradée du site, a été installé un centre régional de mise en quarantaine et d'exportation du bétail à destination des pays du Golfe. Centre dont l'alimentation du bétail provient en partie de l'Ethiopie et de quelques initiatives locales dans la plaine de Hanlé. Le centre est composé d'un site de débarquement d'animaux et un autre d'embarquement après une période de transit.

Contexte politique

La population du pays se concentre essentiellement dans la capitale (65%). Et, avec les autres villes côtières, c'est environ 88% de la population du pays qui vit dans les zones côtières. Une agriculture, essentiellement maraîchère, se pratique tout le long du littoral de Djibouti où se situent le plus grand nombre d'exploitations agricoles. Un élevage semi sédentaire extensif s développe ces dernières années autour des centres urbains dont notamment Djibouti.

La République de Djibouti se situe dans une position géographique qui lui confère un intérêt géostratégique de premier plan, située sur une zone tampon constituant la route des hydrocarbures. Le pays jouit d'une situation politique stable dans une région marquée par des conflits armés et des instabilités politiques diverses tout autour.

Khor Angar

Les populations du site de Khor Angar semblent marginalisées sur le plan économique et demeurent sans appui politique. Elles sont organisées en association mais convoitée par les riches pêcheurs yéménites riverains de la mer rouge et commerçants érythréens pour les meilleurs produits et ressources halieutiques importantes (langoustes, concombre de mer ...) que recèle la zone.

Atar-Damerjog

Du fait de la proximité immédiate de la capitale, les populations du site d'Atar-Damerjog, profite des opportunités d'échanges économiques avec la ville de Djibouti. Elles sont organisées en association pour défendre leurs intérêts mais restent marquée par la dégradation de leur base de subsistance (maraîchages).

ANALYSE ET JUSTIFICATION AU REGARD DE SES LIENS AVEC LES CHANGEMENTS CLIMATIQUES ET SECTEURS CONCERNÉS

Les problèmes majeurs auxquels sont confrontés les populations de la zone côtière de Khor Angar et de Atar-Damerjog dans le littoral sud sont:

- l'intrusion saline due à Khor Angar à l'absence de précipitation pour la recharge de la nappe par suite des sécheresses récurrentes; et à Damerjog à l'usage de motopompe pour l'exhaure de l'eau d'irrigation conjuguée aux sécheresses récurrentes de ces sept dernières années;
- l'ensablement et envasement des bras de mer alimentant les reliques de mangroves de certains sites comme à Khor Angar; et le prélèvement de sable et argile à Atar-Damerjog pour les besoins de construction; cette dégradation du milieu a pour conséquence la fragilisation de l'écosystème et l'affaiblissement des capacités d'adaptation de la population;
- l'élévation des températures causant un besoin plus important en eau pour la consommation humaine et du cheptel, le recul des poissons du rivage et augmentant l'évapotranspiration;
- l'érosion des plages côtières favorisées à Atar-Damerjog par les prélèvements de sable et d'argile pour l'usage des constructions immobilières et le déferlement des vagues lors des marées hautes.

La situation sans projet entraînerait pour Khor Angar la fermeture du bras de mer alimentant la forêt galerie de palétuviers et donc la mort de cette végétation à court terme avec les conséquences que cela peut engendrer aux populations riveraines. Pour Atar-Damerjog, la situation sans projet se traduira par une surexploitation de la nappe par pompage pour l'irrigation et par conséquent une intrusion saline à vitesse plus rapide entraînant la disparition progressive des exploitations agricoles en plus des conséquences que cela pourra engendrer pour la nappe alimentant la ville de Djibouti.

DESCRIPTION

Objectifs

- Régénération de la mangrove de la zone de Khor Angar;
- Amélioration de l'approvisionnement en eau des communautés locales du village de Khor Angar et la recharge de la nappe;
- Amélioration des pratiques agricoles de la zone de Atar-Damerjog;
- Diversification des activités de subsistance dans les deux sites de Khor Angar et de Atar-Damerjog.

Activités

Khor Angar

Ligne de base:

- Adduction d'eau depuis Bissidoro;
- Aménagement d'un périmètre maraîcher;
- Restauration de la forêt de mangrove;
- Organisation des communautés des pêcheurs, éleveurs, et maraîchers.

Coûts additionnels:

- Ouverture du canal d'alimentation en eau de mer et stabilisation des berges;
- Entretien de la mangrove par des opérations de nettoyage et de replantation de la partie sud de la mangrove;
- Adduction d'eau à partir du forage de Samalou;

- Développement d'activités agricoles complémentaires;
- Gestion participative du bilan et système hydrologique;
- Réalisation de travaux de conservation des eaux et des sols et à travers des seuils de ralentissement;
- Amélioration et développement de l'apiculture traditionnelle.

Atar-Damerjog

Ligne de base:

- Réalisation de forages équipés de système d'adduction et pompes électriques en substitution de la motopompe;
- Aménagement du site maraîcher avec canaux d'irrigation;
- Organisation des producteurs;
- Travaux des sols;
- Mise en défens de 45 Ha d'acacia à but fourrager.

Coûts additionnels:

- Réalisation de travaux de conservation des eaux et des sols et à travers des seuils de ralentissement au niveau des bassins versants pour la recharge de la nappe;
- Sensibilisation des communautés locales à la restauration des berges pour une meilleure gestion des crues dans les oueds;
- Introduction d'autres moyens d'exhaure propres et abandon de la motopompe;
- Développement de cultures fourragères et arboricoles tolérantes aux conditions du milieu (sel et températures élevées);
- Mise en place de mécanismes de gestion des pâturages couplés à la mise en défens de 50 ha d'acacias;
- Elimination des Prosopis;
- Appui à la production et à la commercialisation des produits maraîchers pour une amélioration du revenu des familles marginalisées;
- Recours à des systèmes d'exhaure;
- Reconversion des producteurs vers les fourrages irrigués plus tolérants au sel;
- Restauration des berges des sites et carrière de sable.

Intrants

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

Résultats à court terme

Khor Angar

- Régénération de la mangrove assurée;
- Approvisionnement en eau assuré;
- Amélioration de la qualité de l'eau assurée;
- Production de pêche améliorée.

Atar-Damerjog

- Abandon des motopompes et introduction de moyens d'exhaure adaptés réussis;
- Recharge de la nappe améliorée;
- Salinisation des terres jugulée;
- Cultures adaptées à la salinisation promue;

- Production agricole augmentée.

Résultats potentiels à long terme

Khor Angar

- Recharge de la nappe améliorée;
- Subsistance améliorée grâce aux activités agricoles et piscicoles complémentaires;
- Information, éducation et formation des communautés locales assurée;
- Gestion participative de l'eau mise en place;
- Diversification des revenus assurée.

Atar-Damerjog

- Participation des communautés locales effective;
- Gestion des parcours améliorée;
- Alimentation en eau de la capitale améliorée.

MISE EN OEUVRE

Arrangements institutionnels

Le projet sera exécuté sur les deux sites par un conseil national pour le développement durable qui sert d'organe de pilotage appuyé par un observatoire scientifique et technique que préside le Ministère de l'Environnement et comprenant les partenaires au développement et certaines institutions scientifiques: le CERD et l'Université. L'encadrement technique sur le terrain sera assuré conjointement par le Ministère de l'Environnement et par les Ministères et institutions chargés de l'Agriculture, de l'eau et de l'énergie, chacun selon son domaine de compétence. Le ministère chargé de l'Environnement assurera la coordination du projet.

Au niveau régional, il y a un comité de mise en oeuvre présidé par le Commissaire ou le Président du Conseil Régional, selon ce que l'évolution du processus de décentralisation aura permis au moment du démarrage du projet. Les institutions déconcentrées de l'Etat, les structures décentralisées et les ONG participeront étroitement à la réalisation de toutes les activités, chacun selon son domaine de compétence.

Enfin, au niveau local des comités villageois de développement assureront la fourniture de la main-d'oeuvre non spécialisée dans l'exécution des travaux de terrain sous l'encadrement avisé des ONG et le contrôle des services concernés.

L'ensemble de ce dispositif a été consulté et a exprimé son consentement à la mission d'identification du projet organisée par le MUHEAT.

Risques et obstacles

Les risques et les obstacles de mise en place du projet peuvent venir de la faiblesse de la participation des communautés locales qui ne se sentent pas suffisamment impliquées dans les différentes phases.

Exemples de facteurs pouvant affecter la mise en oeuvre du projet?

Evaluation et suivi

Le conseil national pour le développement durable mettra en place un comité scientifique que l'on pourrait dénommer Observatoire Scientifique de l'Environnement des sites en vue d'avoir des avis contradictoires sur les résultats et qui peut servir en même temps de comité technique de suivi et d'évaluation du projet

pour s'assurer que les résultats escomptés et les délais de mise en oeuvre soient respectés. Il fournira régulièrement des rapports détaillés à l'organe de pilotage.

Ressources financières

Le projet peut être considéré comme une initiative qui se soutient toute seule (*stand-alone project*) étant donné l'absence d'activité de développement complémentaire prévisible dans l'immédiat. L'action envisagée par le promoteur Saoudien est une activité totalement indépendante de la restauration du site dégradé.

PLAN DE FINANCEMENT

Total: USD 1,000,000

ACTIVITES	COUTS (En USD)
Khor Angar	
Ouverture du canal d'alimentation en eau de mer de la mangrove	7000
Entretien de la mangrove par des opérations de nettoyage et de replantation de la partie sud de la mangrove	2000
Adduction d'eau à partir du forage de Samalou ou de Bissidoro	21000
Développement d'activités agricoles complémentaires	85000
Gestion participative de l'eau	25000
Réalisation de travaux de conservation des eaux et des sols et à travers des seuils de ralentissement	60000
Amélioration et développement de l'apiculture traditionnelle	30000
Sous total	500 000
Atar-Damerjog	
Construction de seuil de ralentissement des eaux de crues	85000
Sensibilisation des communautés locales à la restauration des berges pour une meilleure gestion des crues	50000
Introduction d'autres moyens d'exhaure propres et abandon de la motopompe	135000
Développement de cultures fourragères et arboricoles tolérantes les conditions du milieu (sel et températures élevées)	60000
Mise en place de mécanismes de gestion des pâturages couplés à la mise en défens de 50 ha d'acacias.	80000
Elimination des Prosopis	35000
Appui à la production et à la commercialisation des produits maraîchers pour une amélioration du revenu des familles marginalisées	5500
Sous total	500000
Total du projet	1 000 000

Ligne de base	0
GEF	1 000 000

DJIBOUTI

NAPA PRIORITY PROJECT NO. 5

PROMOTION DES EXPLOITATIONS D'AGRO-ÉLEVAGE INTÉGRÉ ET DE DÉVELOPPEMENT DES TECHNIQUES D'IRRIGATION ET D'EXHAURE POUR LUTTER CONTRE LA SALINITÉ DES TERRES

BUT DU PROJET

Amélioration des techniques agricoles, de l'association de l'agriculture/élevage et de la lutte contre la salinité des terres agricoles pour réduire la vulnérabilité dans le district de Dikhil, la plaine côtière de Tadjourah et le district d'Ali Sabieh aux changements et variabilité climatiques.

DESCRIPTION DE LA SITUATION ACTUELLE DES SITES DU PROJET

Environnement physique des zones du projet

L'agriculture est une activité récente en république de Djibouti et subit des contraintes multiples liées aux changements climatiques (pluviométrie faible et irrégulière, salinité croissante des eaux d'irrigation). Grâce à l'appui du Gouvernement, les périmètres agricoles se sont multipliés depuis deux décennies sur les terrasses des oueds où existe une disponibilité d'eau et de terres alluvionnaires.

La principale contrainte est la quantité et qualité de l'eau. En effet, le niveau de l'eau dans les puits baisse en période de sécheresse, ce qui favorise également la salinisation. Cela a un impact négatif sur la production agricole et les revenus des familles d'agro-éleveurs des sites cibles du projet qui sont Gobaad (district de Dikhil), plaine côtière de Tadjourah (Sagallou, Kalaf et Ambabo) et Assamo (district d'Ali-Sabieh).

Inversement, les crues périodiques des oueds et l'érosion hydrique causent des dégâts aux infrastructures hydrauliques et aux récoltes. L'activité agricole dominante est le maraîchage et un peu d'arboriculture fruitière associée parfois à un élevage de quelques têtes de bétail semi sédentaire: les animaux pâturent les parcours avoisinants pendant les périodes favorables qui font suite aux rares pluies (notamment de l'été, en saison « Karan/Karma) et reçoivent des compléments de céréales (maïs ou son de blé). En conséquence, l'association agriculture élevage constitue une des alternatives pour diversifier les productions et développer l'élevage sédentaire par la vulgarisation à large échelle dans les périmètres d'espèces fourragères adaptées, ce qui allégerait la pression sur les parcours alentour.

Pour éviter la surexploitation des nappes par l'utilisation du moyen d'exhaure habituel, le projet permettra l'introduction de technologie alternative (éolienne, pompe solaire, pompe à pédale) et également la mise en place de techniques de protection des berges contre les crues (système de gabions, seuils de ralentissement des eaux).

La situation socioéconomique de la zone du projet

Les agro-éleveurs des zones ciblées par le projet enregistrent une baisse de leurs productions et une détérioration de leurs revenus. Les impacts des changements climatiques ont amené un abandon de quelques 100 parcelles agricoles à Gobaad et d'une cinquantaine dans la plaine côtière de Tadjourah en raison notamment de la

salinité précoce des terres et/ou des crues dévastatrices des oueds. La situation des agro-éleveurs s'est aggravée régulièrement avec d'importantes pertes au niveau des récoltes et des infrastructures hydroagricoles soit à cause de l'impact des crues et de l'érosion ou de la salinité. Sur un ensemble de plus de 350 périmètres agricoles des 3 sites du projet, environ un quart n'est pas régulièrement cultivée en raison des facteurs décrits ci-dessus.

Le gouvernement, sur ses fonds propres, a lancé en 2005 un programme de diversification des productions par la plantation de variétés de palmier dattier performantes *in-vitro* reçues de l'Arabie saoudite (1300 pieds plantés en 2005 et 6500 pieds qui sont en train d'être plantés pendant la saison fraîche 2006/2007).

ANALYSE ET JUSTIFICATION

La plupart des parcelles agricoles qui sont situées sur les terrasses des oueds pour bénéficier d'une meilleure disponibilité en eau et terres alluviales. De ce fait, elles sont exposées aux crues et au phénomène climatique qu'est la sécheresse. L'utilisation de moyen d'exhaure inadapté (motopompe) favorise la salinisation des eaux pour l'irrigation. Ces techniques inappropriées d'irrigation ont entraîné une salinisation précoce des terres agricoles dans les sites du projet comme Gobaad et la plaine côtière de Tadjourah. Dans la zone d'Assamo, les rendements et la production souffrent par l'impact des sécheresses (baisse du niveau de l'eau des puits) et à cause de l'érosion et des crues périodiques qui détruisent les infrastructures.

Le projet devra permettre une protection contre les crues, des travaux de conservation des sols pour favoriser la réalimentation des nappes et l'introduction de technologies d'exhaure adaptée ainsi qu'une vulgarisation de variétés et d'espèces fourragères permettant une association agriculture/élevage. Si aucune action n'est entreprise, la pratique de l'agriculture est condamnée à moyen terme dans ces zones.

DESCRIPTION

Objectifs et activités

- Protection des périmètres agricoles contre les crues des oueds;
- Vulgarisation d'espèces fourragères performantes pour promouvoir l'association agriculture/élevage;
- Formation des agro-éleveurs en techniques agricoles adaptées au contexte locale;
- Renforcement de l'organisation coopérative pour une meilleure autonomie et prise en charge de leurs problèmes;
- Introduction de technologies propres d'exhaure de l'eau.

Intrants

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

Résultats à court terme

- L'offre fourragère des zones aménagées est améliorée;
- La disponibilité de l'eau est améliorée pour l'abreuvement du bétail et les éleveurs;
- Usage de la mangrove comme pâturage évité.

Résultats à long terme

- Ressources halieutiques conservées.

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'Élevage et de la Mer, plus particulièrement la Direction de l'Agriculture et des Forêts en collaboration avec les autres autorités compétentes (Commissaires de la République, Conseils régionaux).

Le projet sera piloté par un comité présidé par le Ministère de l'Environnement et comprenant les départements techniques concernés. Au niveau local il y aura un Comité de gestion composé des services techniques et des Communautés locales. Le projet sera exécuté sur le terrain par des opérateurs privés.

Risques et obstacles

Les risques sont limitées 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.

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 765,000

(1USD = 170 FD)

	USD
Ouvrages de protection des périmètres agricoles contre les crues des oueds	100 000
Développement et Vulgarisation d'espèces fourragères performantes	90 000
Travaux de restauration de la mangrove	100 000
Formation des agro-éleveurs	90 000
Structuration et organisation des agro-éleveurs	90 000
Introduction de technologies propres d'exhaure de l'eau	295 000
Total	765 000
Ligne de base	0
GEF	765 000

ETHIOPIA

NAPA PRIORITY PROJECT 7

REALIZING FOOD SECURITY THROUGH MULTI-PURPOSE LARGESCALE WATER DEVELOPMENT PROJECT IN GENALE–DAWA BASIN

RATIONALE/JUSTIFICATION

in relation to climate change, including sectors concerned

The mainstay of Ethiopian economy is subsistent and rain-fed agriculture. 85% of the population is engaged in farming. Compounding the problem, drought and flood dictates our lives. The largest part of the country is under semi-arid and arid ecology. According to the recent Human Development Resource, incidence of poverty is considered to be one of the highest in the world with 55% of the population below the poverty line –in some regions, as high as 85%. Food is unsecured and health problems are prevalent. Climate change makes this situation more serious. It is therefore imperative to opt to multipurpose large-scale irrigation project ameliorate the impacts of recurrent drought in the country.

Towards this end, an integrated developmental project to develop the adaptive capacity of drought prone population within Genale - Dawa River Basin (in southern part of Ethiopia) is proposed. It is in this Basin that the higher percentage of people under poverty line. Infrastructures such as electricity, water supply, health are absent. The region is known with subsistence farming and pastoral livelihood facing frequent drought and rainfall declining abruptly. More than 91% of the population in the Basin lives in rural areas, where accessibility of basic needs hardly any.

The Basin is a highland –lowland system with a risk of natural resource degradation, particularly water and land, due to a rapid increase in the demand of water and high variability. The multipurpose project entails large-scale irrigation, food security (large-scale agriculture of food and cash crops), rural water supply (drinking) and sanitation, water supply for livestock and hydro-power generation. The Basin has an area of 168,000 km², annual flow of 6.10 billons cubic meter of annual flow and 406,000 ha of irrigable land, optimal for this type of project.

DESCRIPTION

Objectives

- To contribute to the reduction of poverty, improvement of the welfare of the rural populations and sustainable natural resources management towards viable sustainable development in the basin.
- To improve the living standard and general socio-economic well being of people
- To realize food self-sufficiency and food security of population in the Basin.
- To extend water supply and sanitation coverage to large segments of the society
- To access electric energy from the hydropower for multiuse
- To increase the availability of water for livestock, crop irrigation, aquaculture, energy , rural industry and domestic use

Activities

- Assessment and review of existing master plans and works on Genale–Dawa river basin;
- Feasibility studies;
- Construction of dams;
- Training of personal on irrigation development and management.

Short-term outputs

- Increased availability of water for livestock, crop irrigation, aquaculture, rural industry and domestic use;
- Dams constructed;
- Irrigated land;
- Increased agricultural production;
- Hydro power generated;
- Capacity built in irrigation management.

Potential long-term outcomes

Improved livelihood with minimum impact of climate variability and change with easy access to drinking water, water for livestock, electricity, reliable food production and cash crops towards food security

IMPLEMENTATION**Institutional arrangement**

Ministry of Water Resources will be the lead institution to coordinate the project

Risks and barriers

Lack of finance, lack of technical capacity, environmental impact, legal/institutional

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 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 700 million

Project design: USD 2 million

GUINÉE

NAPA PRIORITY PROJECT 3

OPTION II: VALORISATION DES CONNAISSANCES ET PRATIQUES ENDOGENES POSITIVES PROJET 2-1 VALORISATION DES CONNAISSANCES ET PRATIQUES ENDOGÈNES POSITIVES

Localisation: Kouroussa, Beyla, Koundara et Boké

Secteur: Transversal

JUSTIFICATION

Les zones ciblées par le projet sont caractérisées par une dégradation prononcée des écosystèmes et de leurs ressources suite à des activités anthropiques inappropriées, entraînant l'acidification des sols (Boké), l'assèchement des mares (Kouroussa), l'aridification des sols (Koundara, Beyla). Les écosystèmes et leurs ressources sont d'une importance capitale pour les populations guinéennes qui en dépendent encore directement pour la satisfaction de leurs besoins fondamentaux: nourriture, habitat, soins de santé, habillement, matériaux de construction, combustibles et revenus. Les communautés locales ont des pratiques endogènes séculaires de gestion des ressources naturelles, dont certaines, encore vivaces, leur ont permis de vivre en parfaite harmonie avec l'environnement. Cependant, sous l'effet de la modernité, certaines de ces pratiques positives sont en voie de disparition. Il est donc impérieux d'identifier ces connaissances et de lever les obstacles à leur valorisation. Cette valorisation permettrait une exploitation durable des écosystèmes et de leurs ressources et de développer de nouvelles sources de revenus. Ce projet est en adéquation avec les orientations retenues par la stratégie nationale de conservation de la diversité biologique et l'utilisation durable de ses ressources.

DESCRIPTION

Objectifs

Global

Valoriser les connaissances et pratiques traditionnelles positives en vue d'une adaptation aux changements climatiques

Spécifiques

- Identifier les usages coutumiers des écosystèmes et leurs ressources;
- Promouvoir les usages à potentiel écologique et économique élevés;
- Encourager la protection des écosystèmes et le maintien des espèces dans leur milieu naturel;
- Intégrer les connaissances aux stratégies de conservation.

Activités

- Information et sensibilisation des communautés concernées;
- Identification des connaissances et pratiques traditionnelles locales;
- Evaluation des valeurs socio-économiques des connaissances et pratiques traditionnelles;
- Valorisation des connaissances et pratiques traditionnelles;
- Suivi et évaluation.

Résultats attendus

Communautés cibles informées et sensibilisées;
Principales connaissances et pratiques traditionnelles des communautés identifiées;
Valeurs écologiques et socio-économiques des connaissances et pratiques traditionnelles identifiées et diffusées;
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

Indicateurs de suivi

- Pourcentage des populations informées et sensibilisées;
- Répertoire des connaissances et pratiques traditionnelles;
- Nombre de technologies endogènes diffusées;
- Nombre de rapports de Suivi-évaluation fournis.

Durée

3ans

COÛT

USD 300,000

HAÏTI

NAPA PRIORITY PROJECT 011

GESTION AMÉLIORÉE DES RESSOURCES NATURELLES DANS LE DÉPARTEMENT DE L'ARTIBONITE.

Localisation: Chenot (Marchand Dessalines)
Secteur: Agriculture
Durée: 2ans
Option: Préservation de la sécurité alimentaire (Option 4)

JUSTIFICATION

La zone et les communautés rurales de Chenot sont très vulnérables aux Changements Climatiques. Située en altitude, entre 650 et 1100m, dans la chaîne des Cahos, cette zone est dominée par les pentes supérieures à 30%. Classée autrefois comme zone humide d'altitude⁴ comportant des peuplements denses de feuillus abritant des caféières⁵, la chaîne des Cahos présente actuellement des caractéristiques de montagne sèche et est fortement érodée par suite du brûlis des terres et d'un déboisement accru pour la production de charbon durant ces 20 dernières années⁶. Les versants sont dénudés par la culture du haricot, la seule culture rentable dans la zone; la majorité des sources tarit à la saison sèche et dorénavant une seule saison agricole, contrairement aux 2 habituelles, est possible. La zone fait face à une grave insécurité alimentaire.

Malgré tout, Chenot n'est pas vide d'intérêt. Elle fait partie de la zone de production du très réputé «café de Saint Marc » et se trouve dans le bassin versant de la Rivière l'Estère dans l'Artibonite. Le présent projet représente l'un des axes prioritaires d'intervention identifiés en septembre 2003 au cours du processus participatif d'élaboration d'un plan d'action pour la zone de Chenot, Lacroix⁶ et les zones avoisinantes.

DESCRIPTION

Objectifs

Les objectifs poursuivis par le projet sont les suivants:

- Promouvoir une meilleure gestion des sols et des résidus de récolte
- Diversifier et améliorer la production alimentaire
- Augmenter la couverture végétale
- Augmenter les capacités de réponse locales

Activités

- Former 320 griculreurs membres d'organisation de base en techniques modernes de conservation de sols, en agro-écologie et en « lutte contre la désertification »
- Construire 1km⁵⁰ de canaux de contour
- Améliorer les techniques de travail du sol sur 500ha de terre et 183 parcelles
- Divulguer les techniques de préparation de compost à partir des résidus de récoltes et autres déchets végétaux;
- Mettre en terre 10,500 plantules fruitières, 4,500 plantules forestières et 7,000 pieds de bambou;

- Planter 15ha en des variétés de cultures rentables comme les tubercules (igname, taro), la banane, le giraumont et les légumes;
- Faire le greffage de 3,500 arbres fruitiers
- Réaliser 15 jardins modèles suivant les techniques véhiculées au cours des séances de formation

Intrants

Les intrants du projet:

- Equipements: dérapines, houes, pelles, niveau A, clisimètre, greffoir, tape à greffer;
- Matériel végétal: semences et semenceaux, plantules, drageons, greffons, boutures;
- Matériel de formation et de divulgation: cahier, craie, pad et marqueurs, clipchart, trépieds;
- Ressources humaines: formateurs, techniciens en agroforesterie et en environnement.

Extrants à court terme

Les extrants à court terme:

- 500 ha de terre, 183 parcelles aménagées et 1.5 km de structures de conservation de sol érigées;
- 15.000 arbres plantés dont 10.500 fruitiers ainsi que 7.000 pieds de bambou mis en terre;
- 6 m³ de compost produit;
- Équivalent de 15 ha plantés en cultures rentables et 3.500 fruitiers greffés;
- 15 jardins modèles, 320 personnes formées en agro-écologie et en lutte contre la désertification;
- Amélioration des capacités des agriculteurs et organisations de base.

Résultats potentiels à long terme

La réalisation des activités peut permettre d'obtenir à long terme les effets suivants:

- Réduction de l'érosion des sols et amélioration de la fertilité des sols;
- Augmentation de la couverture végétale et de la disponibilité alimentaire;
- Réduction des émissions de GES provenant du brûlis des résidus de récolte et des terres;
- Adoption de techniques et systèmes de culture permettant l'amélioration des revenus;
- Amélioration de la disponibilité de l'eau pour réduire la vulnérabilité à la pénurie d'eau.

MISE EN OEUVRE

Risques et obstacles

L'impact important du projet sera de courte durée si:

- Il n'y a pas un engagement de la communauté à diminuer trois pratiques destructives en cours: le brûlis, le pâturage libre du bétail et la coupe incontrôlée des arbres;
- Les catastrophes naturelles et celles liées à l'homme s'aggravent et empêchent la réalisation des activités et les perturbent fréquemment;
- L'instabilité politico-économique persiste.

RESSOURCES FINANCIÈRES

Le coût total du projet est de:

USD 266,200

	Cash	Nature
1- Coût Total Projet	266 200	
2- GEF	166 200	
3- Co-financement / Partenaires potentiels	80 000	
Gvt. Haïtien / MDE/PIP		10 000
Fonds Assistance Economique et Social		
Participation communautaire/ CRAD		10 000

KIRIBATI

NAPA PRIORITY PROJECT 4

KIRIBATI NAPA SECTION 6.2.5

PROJECT MANAGEMENT INSTITUTIONAL STRENGTHENING FOR NAPA

RATIONALE

Climate Change has been recognized in the National Development Strategies (NDS) as a potentially costly risk to national economic growth. This requires a whole of government approach to adaptation. To this end, relevant Ministries have been working on how best to include Climate Change adaptation activities in their Ministries Operational Plans (MOPs) as part of the Kiribati Adaptation Project. The NAPA will incorporate immediate and urgent adaptation needs into relevant Ministries MOPs.

The NAPA will contribute to the momentum of the national efforts to adopt multi-year output budgets and to integrate externally assisted adaptation outputs into the system. It is a learning experience for all Ministries and for this system to work a high competence and commitment is desired. The NEPO is expected to provide guidance and leadership role in driving forward this operational planning system.

DESCRIPTION

Objectives

1. To operationalize externally assisted adaptation projects through MOPs as part of the whole of government approach to adaptation, and integrate them into the national development planning and budgetary management systems;
2. To initiate a process of integrating climate change consideration into sector policies, strategies and project planning;
3. To gain experience in:
 - a. operationalizing NAPA through MOPs,
 - b. factoring climate change into sector project planning,
 - c. use lessons learnt when replicating NAPA operational planning in other MEA programmes undertaken in Kiribati;
4. To promote public awareness of linkages and consistency of the NAPA with poverty reduction strategies and other MDGs.

Activities

The Ministry of Finance and Economic Development, through the National Economic Development Office, is responsible for overall national development planning, budget and monitoring. Mainstreaming of externally funded adaptation projects into national policy development and socio economic planning processes are through MOPs. Monitoring and reporting are recently introduced. This is critical for ensuring sustained national efforts with external support, at adaptation.

Ministries will include NAPA activities for which they are responsible in their respective MOPs. NEPO has a major responsibility to provide guidance on the preparation, and monitoring of MOPs. This guidance will be based on current NDS, CCA policy and internationally agreed goals of development efforts. In implementing

NAPA activities it will be useful to regularly monitor that they follow the guidance. NAPA activities will therefore enable NEPO to strengthen its role in this area.

Experience that will be gained by the NEPO in taking greater responsibility for operationalizing NAPA activities through MOPs will be useful for other UN environmental conventions. This experience will facilitate the mainstreaming of current and future national programs implementing any of these conventions.

Operational planning has only recently been introduced into the national planning process. Operational planning will be a learning process and this will be facilitated as NEPO and Ministries adopt this planning tool on NAPA activities. In this way the economics of climate change and other environmental issues will begin to be recognized. The requirement that NEPO be exposed to the economics of climate change, adaptation planning, and available tools will reinforce that recognition. NEPO will share this knowledge with other ministries through workshops.

Outputs

- NEPO assumes and gets involved in the process of adaptation planning and operationalizing projects such as the NAPA projects;
- Adaptation projects such as KAP and NAPA are directed towards pro poverty policies and strategies;
- Enhance collaboration between NEPO and Ministries for adaptation planning and operational planning is enhanced;
- Awareness raising materials on adaptation planning and its integration into the national development planning process;
- Workshops as an awareness raising strategy;
- Adequate resources for implementing the MOPs.

COST

AUD 319,440 (+10% contingency cost)

Indicative costs (AUD)	Local annual budget (AUD)	Total NAPA Costs Over 3 yrs	Responsible Ministry
234 000	85 440	319 440	MFED

KIRIBATI

NAPA PRIORITY PROJECT 9

KIRIBATI NAPA SECTION 6.2.10

ENABLING EFFECTIVE PARTICIPATION AT INTERNATIONAL FORUMS

RATIONALE

As climate change is a global concern with effects felt at local levels these effects need to be brought out at regional and international forums on climate change so as to guide global responses to climate change. More lately, Kiribati participation at these forums has been at technical ministries level only without representation from Kiribati foreign affairs ministry. The ministry has responsibility with technical ministries for voicing and assessing Kiribati position on major international issues and climate change is among the major issues. Inclusion of MFAI in Kiribati delegation to such forums will ensure effective voicing of information from national circumstances to assist with planning global responses to climate change.

DESCRIPTION

Objectives

1. To enhance the effectiveness of conveying climate change related information based on Kiribati national circumstances to regional and international meetings on climate change.
2. To increase Kiribati capability to influence international efforts at mitigating climate change, and at addressing immediate and urgent, and longer term adaptation needs.

Activities

MFAI will more regularly attend regional and international climate change meetings as part of Kiribati delegation. Kiribati delegation to regional and international meetings on climate change will encourage a wider geographical participation in existing climate change related international agreements. Funding support from the international community for climate change adaptation will be essential for adaptation, and MFAI will be able to explore available sources.

Outputs

- Ministry of Foreign Affairs is kept abreast of international issues on climate change;
- Kiribati develops well coordinated whole of government concern and position based on update information from IPCC, and national circumstances at international meetings on climate change;
- Adaptation undertakings in Kiribati proceed without facing barriers arising from lack of information and understanding of available international support mechanisms.

COST

AUD 105,000 (+10% contingency cost)

Indicative costs (AUD)	Local annual budget (AUD)	Total NAPA Costs Over 3 yrs	Responsible Ministry
60 000	45 000	105 000	MFAI

LESOTHO

NAPA PRIORITY PROJECT 3

CAPACITY BUILDING AND POLICY REFORM TO INTEGRATE CLIMATE CHANGE IN SECTORAL DEVELOPMENT PLANS

RATIONALE

The awareness campaigns on climate change issues were initiated in 1996 following the country's ratification of the UNFCCC in 1995. While the potential impact is acknowledged and appreciated in Lesotho, the issues around climate change have not been integrated into the national development agenda in any significant way. Climate change affects all aspects of life hence national stakeholders broadly acknowledge that it should be accorded high priority along with other national challenges such as HIV/AIDS and Poverty Reduction.

This project seeks to mainstream climate change issues into the national policy development debates and legislative frameworks by building capacity at both institutional and systemic levels. In Lesotho, climate change affects major economic sectors: water, environment, agriculture, forestry, energy etc. The major limitations in the current policy developments and legislative frameworks are that issues of climate change are not featuring prominently despite the levels at which the aforementioned sectors are prone to instabilities induced by climate change. The national capacity self assessment process has identified the need to address policy and legislative gaps and /or discrepancies. Thus this project will facilitate awareness raising, policy review and developments including research elements in the various stakeholder sectors.

DESCRIPTION

Objectives and Activities

Objective	Activity
To mainstream the issues of climate change into the national dialogue, policy development, planning and programme implementation	<ol style="list-style-type: none"> a. Advocating for the inclusion of climate change issues in major national programmes – i.e. Vision 2020, Poverty Reduction Strategy, Three-year Development Plans and Local Government Structures; b. Instigating for the development of a national policy on climate change; c. Formulation and implementation of an extensive training programme on climate change; d. Advocating for the inclusion of climate change in the curriculum at the different levels of education and training; e. Urging for the development of legislation on climate change that would facilitate and support the <i>NAPA</i>

Inputs

- Technical expertise;
- Financial resources.

Short-Term Outputs

- Inclusion of climate change in Vision 2020, PRS, and Three-year plans;
- Inclusion of climate change in education and training curricula;
- Introduction of policy and enactment of legislation on climate change.

Potential Long-Term Outcomes

The potential long-term outcome of the project is the increased prominence of climate on the national agenda, and an effective national adaptation programme of action, which will be supported by positive policy and legislative environment.

IMPLEMENTATION

Institutional Arrangement

The Lesotho Meteorological Services will play the project leadership role and will work hand-in-hand with other relevant stakeholders.

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 Ministry of Natural Resources in collaboration with the Ministry of Development Planning. 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 at USD 1,260,000

ACTIVITY	COST (USD)
Advocating for the inclusion of climate change in major national programmes – i.e. Vision 2020, Poverty Reduction Strategy, Three-year Development Plans and Local Government Structures	120 000
Formulation and implementation of an extensive training programme on climate change	410 000
Advocating for the inclusion of climate change in the curriculum at the different levels of education and training	520 000
Urging for the development of legislation on climate change that would facilitate and support the <i>National Adaptation Programme of Action</i>	100 000
Instigating for the development of a national policy on climate change	110 000
GRAND TOTAL	1 260 000

MALDIVES

NAPA PRIORITY PROJECT 1

INTEGRATION OF FUTURE CLIMATE CHANGE SCENARIOS IN THE SAFER ISLAND STRATEGY TO ADAPT SEA LEVEL RISE AND EXTREME WEATHER RISKS ASSOCIATED WITH CLIMATE CHANGE

RATIONALE

All the islands of the Maldives are among the most vulnerable to the rise in sea level associated with climate change. Recent incidences of swells and storms have impacted more than half the populated islands resulting in flooding, loss of property, impacts on water resources and agriculture. The primary aim of this project is to enhance people's safety from climate change impacts and natural disasters, and the path selected is to improve and strengthen the Safer Island Strategy developed by the government to resettle communities from the smaller, more vulnerable islands onto larger, better protected ones. Several components of the Safer Island Strategy may in fact contribute to making islands more vulnerable to climate change impacts and natural disasters, if the climate change scenarios are not adequately considered in the land-use planning and development of safer islands.

At present, the Government of Maldives has planned to undertake a Detailed Risk Analysis of the proposed safer islands. Funding has already been secured to undertake the Disaster Risk Assessments for 9 of the proposed 14 safer islands. The initial risk assessment have highlighted the need to do more detailed analysis on aspects of coastal engineering and adaptation measures on all the islands. The aim of the proposed NAPA project is to ensure that climate change related hazards and vulnerability assessments are adequately covered in the Disaster Risk Assessments and also secure funding to conduct such an analysis for the remaining 5 proposed safer islands. This project would contribute to the resilience of the Maldives in the face of climate change and its capacity to respond effectively to increasing threats posed by climate change and natural disasters.

DESCRIPTION

Goal

Ensure climate change concerns are addressed in the Maldives Safer Island Strategy

Objectives

1. Undertake detailed hazard and vulnerability assessment for 5 of the proposed safer islands;
2. Develop a hazard mitigation and vulnerability reduction action plan Adaptation.

Activities

1. Undertake a hazard and vulnerability assessment which includes risks from climate change;
2. Undertake a composite risk assessment and action plan for hazard mitigation and vulnerability reduction.

Short term outputs

- Hazard assessment of identified safer islands
- Assessment of vulnerability to natural hazards, economic, social and infrastructure and building vulnerability and a coastal risk assessment

- Climate change sensitive criteria for safer islands identified
- Action plan developed

Potential long term outputs

Adaptation to future climate change scenarios integrated into the Safer Island Strategy of the Maldives

IMPLEMENTATION

Institutional Arrangement

Lead agency

Ministry of Planning and National development.

Partner agencies

National Disaster Management Centre; Ministry of Atolls Development; Ministry of Environment, Energy and Water; Ministry of Housing and Urban Development; Ministry of Construction and Public Infrastructure.

Risks and barriers

- Limited Data on hazards;
- Climate hazard at the specific island level difficult to predict;
- In some aspects there are no immediate solutions available.

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

Total project cost: USD 248,820.

Activity	Cost (USD)
1. Undertake a hazard and vulnerability assessment which includes risks from climate change	135 200
2. Undertake a composite risk assessment and action plan for hazard mitigation and vulnerability reduction	113 620
Total	248 820

MALI

NAPA PRIORITY PROJECT NO. 6

OPTION: CONSEIL AGROMÉTÉOROLOGIQUES ET PLUIES PROVOQUÉES

**TITRE DU PROJET: UTILISATION DES INFORMATIONS
MÉTÉOROLOGIQUES POUR AMÉLIORER LA PRODUCTION AGRICOLE
ET CONTRIBUER À LA SÉCURITÉ ALIMENTAIRE DU MALI.**

Localisation: Tout le territoire
Secteur: Agriculture

JUSTIFICATION

Le Mali, comme les autres pays de la région sahélienne, subit depuis les années 1970 des sécheresses récurrentes et sévères, conséquences probables des changements climatiques qui ont contribué à dégrader les écosystèmes avec de lourdes pertes aussi bien pour les populations que pour le cheptel.

Un autre constat à ces sécheresses, est que les paysans manifestaient une certaine panique dans l'exécution des travaux cultureux, notamment le semis, sur le début et la fin des saisons des pluies ainsi que sur les perturbations (épisodes secs) au cours de la campagne.

Aussi dans d'autres domaines socio- économique, la production d'eau potable et d'énergie hydro électrique, le tarissement et l'assèchement précoce des mares, la prolifération des maladies sont sujettes aux changements climatiques.

Face à tous ces problèmes, le Gouvernement dans sa politique de recherche de l'autosuffisance et de sécurité alimentaire a développé des actions d'assistance agrométéorologique.

DESCRIPTION

Objectif global

Fournir au monde rural des avis, conseils météorologiques et appuis techniques leur permettant de mieux planifier les activités agricoles et de les exécuter plus efficacement afin d'améliorer la production.

Objectifs spécifiques

- Contribuer à la sécurité et à l'autosuffisance alimentaires par la prise en compte des informations météorologiques afin de réduire les poches de sécheresse, d'allonger la durée de la saison des pluies; stockage des eaux de ruissellement;
- Favoriser le remplissage des barrages;
- Réduire la pauvreté chez les paysans et les éleveurs;
- Réduire l'exode rural;
- Renforcer et entretenir des réseaux de stations météorologiques et assurer la collecte et la transmission des données ago-climatiques et satellitaires;
- Former les producteurs sur les observations agro-météorologiques et l'utilisation du calendrier prévisionnel des semis.

Faisabilité technique

- Existence d'une expertise technique pour l'encadrement des populations;
- Existence d'une expertise nationale à travers la DNM;

- Besoins exprimés par les populations lors des consultations locales;
- Les objectifs du projet cadrent avec les orientations du CSLP.

Faisabilité financière

- Appui du FEM;
- Apport de l'Etat;
- Apport des collectivités;
- Existence d'un certain nombre de projets dans la zone dans les zones d'exécution du projet qui pourraient apporter leur synergie.

Résultats attendus

- Amélioration des prises de décision;
- Augmentation et sécurisation de la production agricole et pastorale;
- Opérationnalisation de système de pluie provoquée permettant de réduire les poches de sécheresse et améliorer les retenus d'eau.

Activités

- Elaboration et diffusion des informations météorologiques pour les prises de décisions;
- Identification des techniques d'économie de l'eau dans le sol;
- Formation et sensibilisation des différents acteurs;
- Mise en place d'un système de pluie provoquée avec acquisition et installation des équipements appropriés, formation exploitation;
- Assistance aux producteurs ruraux.

Risques et obstacles

- Absence d'équipement adéquat;
- Insuffisance de ressources humaines qualifiées;
- Insuffisance de ressources financière;
- Non maîtrise des risques liés aux pluies provoquées (inondation).

Arrangements institutionnels

Le projet concerne tout le pays sous la responsabilité de la DNM (MET) en collaboration avec les structures impliquées dans le domaine de l'agriculture de la protection de l'environnement. Un Groupe de Travail d'Assistance Agrométéorologique (GTPA) est mis en place qui pilotera l'action.

SUIVI-ÉVALUATION

Indication de suivi/Evaluation

- Nombre de produits météorologiques élaborés radiotélévisé pour la population;
- Quantité apportée par la pluie provoquée;
- Niveau de remplissage des barrages;
- Taux d'augmentation de la production agricole et fourragère;
- Taux de réduction de l'insécurité alimentaire;
- Nombre de producteurs ruraux formés sur les informations météorologiques;
- Nombre de producteurs ruraux formés utilisant les informations météorologiques.

Durée

5 ans

COÛT

USD 2000,000

MAURITANIA

NAPA PRIORITY PROJECT 7

MAURITANIA NAPA SECTION 7.5 LAND ECOSYSTEMS

THE REORGANIZATION OF POPULATIONS ADVERSELY AFFECTED BY CLIMATE CHANGE, TAKING INTO CONSIDERATION THE OPTIONS THEY HAVE ALREADY ADOPTED

Locality	The target areas are the outlying suburban areas of large urban centres, the wetlands and the tarred roads used by the target populations.
Sector	Rural
Field	Fixation of communities on their lands
Type	Social
PIP Reference	Not included in PIP

RATIONALE

The climate changes resulting from the deterioration of the rainfall level have affected the great majority of the rural and nomadic populations. This situation has driven these populations to adopt various strategies to adapt to the new conditions. These strategies include rural exodus, connection between tarred roads and permanent settlement in the favourable areas (wetlands).

DESCRIPTION

Objectives

This situation is harmful to the ecosystems which host these populations and even to these populations themselves. Hence, reorganization of these populations seems necessary.

Activities

The activities to be carried out are the redirection of options already adopted by the populations: population settlement along the tarred roads (adaptation to climate change) and disordered settlement.

Expected outcomes

The expected outcome is the establishment of the populations adversely affected by climate change.

IMPLEMENTATION

Administrative arrangements Administratively, the project will depend on the institution responsible for Nature conservation. Its activity must be complementary to other activities from other relevant ministerial departments.

Risks and obstacles

The risks and obstacles which might be encountered by this project are related to the conditions necessary to make the adaptation options viable and respectful of the environment. It is a question of satisfying the needs of the newly fixed populations as regards drinking water, power, agricultural land, income generating activities, schools, health centres, etc.

Monitoring and assessment indicators

The impacts of the project will be evaluated through the new situation of the newly settled populations. For the purposes of monitoring, the project will be reviewed midway and at the end of the process, and will be subject to audits and field visits and quarterly and half-yearly reports.

Duration

2 Years

COST

USD 600,000

RWANDA

NAPA PRIORITY PROJECT N° 2

MASTERING HYDRO METEOROLOGICAL INFORMATION AND EARLY WARNING SYSTEMS FOR CONTROL OF CLIMATE CHANGE HAZARDS – INSTALLATION AND REHABILITATION OF HYDROLOGICAL AND METEOROLOGICAL STATIONS.

LOCALISATION

Whole country

RATIONALE

Currently, meteorological and hydrological stations that numbered over a hundred in 1989 have been reduced to only one operational station at the Kigali Airport due to effects of the 1994 genocide.

As described in point 2.1 “Current socio-economic and environmental context” of the NAPA, **the present low capacities of observation, description and evaluation** at the same time of hydro meteorological climate stimuli at national, regional, and local scales and their impacts on ecological, social and economic systems do not yet allow a production of data, and enough reliable information for concerned user sectors.

This important level of uncertainty and lack of available hydro meteorological data makes planning exercise much more difficult in Rwanda today. Lack of these data leads various sectoral services to incapacity of prevention, adaptation and resist to extreme phenomena. Reinforcement of surveillance, evaluation and early warning systems of drought and desertification remain insufficient.

In order to respond to these systematic insufficient observations, a project “*Mastering hydro meteorological information and early warning systems for control of climate change hazards – installation and rehabilitation of hydrological and meteorological stations*” is indispensable and urgent so as to identify climate change tendencies throughout the country. These tendencies will help Rwanda in the formulation of appropriate measures of adaptation to prolonged seasonal drought risks or floods due to climate change in different sectors of economic development and at the same time fulfill her commitments to the implementation of UNFCCC concerning the preparation of national communication on the basis of reliable hydro meteorological data and previsions.

INTEGRATION

This project is well integrated in the national policy of disaster and catastrophes management, which aims at the following actions:

- Management of natural catastrophes and evaluation of vulnerability risks by climate change;
- National plan for risks and catastrophes management;
- Development of information and early warning systems;
- Reinforcement of national competences in risks and catastrophes management;
- Integration of risks and catastrophes management in large national programme for poverty reduction, community development and environmental protection;

- Mobilization of resources, training and public awareness, and regular review of plans and programme.

Yet, the prevention and management of catastrophes due to climate change cannot be achieved unless there is reliable data collection from all regions of the country, of their analysis and hydro meteorological previsions.

DESCRIPTION

Objective

Regularly possess historical and current hydraulic and meteorological data useful in all socio-economic sectors including the prevention of disaster and catastrophes due to climate change.

Specific Objectives

- Possess appropriate and functional hydro meteorological services and station.
- Supply information on necessary hydro meteorological previsions to decision makers and different sectoral users so as to prepare in time the fight against dangers of extreme phenomena that may occur.

Components

1. Formulation and preparation of the installation and rehabilitation programme for meteorological and hydrological stations (IRPS-HM);
2. Institutional and organizational reinforcement for optimal implantation of IRPS-HM and its operations;
3. Preparation of invitation to tender documents;
4. Follow up installation and rehabilitation works;
5. Global project follow up and evaluation.

Expected results

Necessary data to the preparation of hydrological previsions and climate tendencies so as to prevent risks of drought and floods is regularly collected and representing the national situation on:

- At least 70 rehabilitated stations and 30 meteorological stations installed;
- 11 hydrological stations are rehabilitated (principal network) and 10 new hydrological stations are to be installed (secondary network).

Beneficiaries

Major beneficiaries are agricultural services, water resource management services, farmers, aeronautical services, research institutions, decision makers, transport and infrastructure services, early warning system and rapid intervention at vulnerable district level.

IMPLEMENTATION

Implementing Agencies

- National Hydro Meteorological Institute (under creation)
- Ministry of Lands, Environment, Forestry, Water and Mines (in charge of climate change project)
- Ministry of Infrastructure
- Ministry of Agriculture and Animal Resources
- Research institutions and agricultural projects

- Decentralized administrative structures (province and districts) for disaster and catastrophes management

Follow-up and evaluation

Institutions: Project coordination, pilot and steering committee, donors (LCDF, OMM, etc);
 Frequency: Term and annual
 Types: Physical and financial
 Methods: Report on activity development with performance indicators;
 Half way review seminars;
 Field visits.

Risks and Barriers

1. Poor financial capacity, poor material and human resources for current hydrological and meteorological services to carry out the project follow up;
2. Lack of sectoral concertation during the preparation of the programme for installation and rehabilitation of hydro meteorological stations;
3. For hydrological stations: the large volume of related works linked to the restoration and consolidation of riversides can generate major costs;
4. Weak current surveillance means for repair and maintenance of stations.

Project Duration

4 years

Period

2007 – 2011

COST

USD 1,900,000

RWANDA

NAPA PRIORITY PROJECT N° 4

ASSISTANCE TO DISTRICTS OF VULNERABLE REGIONS TO PLAN AND IMPLEMENT CONSERVATION MEASURES AND WATER STORAGE

LOCALISATION

Vulnerable regions of East, South East and some zones of the central plateau

RATIONALE

Agro bio climatic regions of the East, South East of the country and certain zones of the central plateau (Umutara, Kibungo, Bugesera, Mayaga, Gitarama) have been identified as vulnerable on many aspects especially in relation to events of frequent droughts affecting poor population.

This project aims at reinforcing district capacities to implement conservation measures and water storage to satisfy irrigation and animal husbandry needs. Districts of these regions shall help to find adequate solutions for rainwater conservation through valleys dams and other adequate systems.

Some zones are producers of superficial water flows and important run-off during rainy seasons and face regular and frequent floods. They could be subject to hydraulic and hydro geological study so as to direct water from those zones so as to stock it in convenient superficial sites or recharge the sheets and utilise them during dry seasons.

At the level of habitat, collecting pluvial water individually or collectively means could also be exploited and reduces the pressure of some rare water points for drinking water use. Through these practices, conflicts of drinking water use, irrigation and water for animals could be reduced in these zones.

INTEGRATION

This planning project is meant for implementation of measures of storage and water conservation in districts of vulnerable regions and responds to objectives and programmes of national policies and strategies. Details on links existing between programmes and this project are developed in the table below:

Policy / National strategy	Objective, Programme / Undertaken planning or for Implementation
Rwanda Vision 2020	Sustainable management of water management
	Modernisation of agriculture
Poverty reduction strategy	Promotion of public works at high manpower intensity (HIMO)
National land policy	Irrigation, especially in zones of aridity tendency
National agriculture policy	Restoration of fertility and conservation of soil
	Realization of valley dams
National strategy and action plan to fight desertification	Realisation of rain water storage for agro pastoral activities

DESCRIPTION

Global Objective

Increase the capacity of the population living in vulnerable regions of East, South East and some zones in central plateau to cope with climate change.

Specific Objectives

- Increase rain water storage capacity and floods in vulnerable districts for irrigation and animal husbandry during dry seasons;
- Reduce the pressure on water points meant for drinking water;
- Reduce conflicts of drinking water utilization in these regions.

Project Components

1. Carry out a hydraulic and hydro geologic study in the central part of Eastern province which gets frequent floods;
2. Analysis of storage of superficial water capacity or the recharge of sheets;
3. Choice and realization of water storage pilot plan;
4. Rehabilitation of existing water points for drinking water and put in place protection areas in East and South East regions;
5. Implementation of protection regulation of these water points.

Expected Results

- A greater proportion of superficial water flows in zones of frequent floods is retained and conveniently stored to satisfy irrigation and animal needs;
- Irrigation and animal husbandry cooperatives through stalling are created;
- Water points (wells and borings) essentially satisfy drinking water needs and are protected;
- Conflicts of safe water utilization are reduced.

Beneficiaries

Small farmers and pastoralists in dry vulnerable zones

IMPLEMENTATION

Implementing Agencies

- Project coordination;
- MINITERE;
- MININFRA;
- Districts;
- REMA.

Follow-up and Evaluation

Institution: Project coordination, pilot and steering committees, beneficiaries and donors.

Frequency: Term and annual.

Type: Physical and financial.

Methods: Reports with performance indicators, seminars, field visits.

Risks and Barriers

1. Hydrological and hydro geological study may not get concrete results and storage sites for surface water or sheets recharging may not exist;

2. Appropriate lands for irrigation are not near storage sites and transport and water pumping may be required and necessary;
3. Risks associated with water-borne transmitted diseases may increase due to bad utilisation of storage water;
4. Low coordination and intersectoral concertation capacity at district level may prolong details of its realisation.

Project Duration

4 years

Period

2007 - 2011

COST

<i>USD 560.000</i>

RWANDA

NAPA PRIORITY PROJECT N° 5

INCREASE THE CAPACITY OF ADAPTATION OF VILLAGES “IMIDUGUDU” IN VULNERABLE REGIONS THROUGH IMPROVEMENT OF DRINKING WATER AND SANITATION AND ALTERNATIVE ENERGY SERVICES AND PROMOTION OF NON-AGRICULTURAL ACTIVITIES

LOCALISATION

Vulnerable regions of the East, South East, North and West

RATIONALE

Prolonged and recurrent droughts on 2 or 3 consecutive years often hit the East and South Eastern regions. On the other hand, Northern and Western regions are particularly exposed to devastating erosion, considerable lands degradation and landslides. In both cases, resulting risks are impoverishment and people migrations in search of new lands for agriculture and animal husbandry, either in protected areas or marginal lands. These migrant populations already present a high level of social and economic vulnerability.

The current effort in the realization of regrouped habitat “Imidugudu” is supposed to answer a triple strategy: Reduce the scattering of rural habitat and pressure on productive lands, improve life conditions of the population through health services, education, access to drinking water, energy supply as well as reducing the pressure on forests and marginal lands.

This effort should be followed and supported by improving life conditions of Imidugudu villages particularly those already installed in vulnerable regions by increasing access to drinking water, sanitation and electricity supply using alternative energy. Furthermore, this effort shall stimulate the regrouping of the population in rural areas due to advantages they find.

To the contrary, in some villages around dense forests and swamps of Akagera national park, Birunga and Nyungwe currently subjected to strict measures of conservation and protection, some families are obliged to leave their agricultural exploitations without getting any other pieces of land due to the exiguity of agricultural lands on the entire territory.

In the integrated project framework, complementary dynamics shall be useful in the promotion of activities (agric-pastoral, crafts industry or HIMO) and non-agricultural employment so as to cater for domestic needs and lead to a gradual and balanced reconversion of activities.

INTEGRATION

This project perfectly finds its integration in national policies, strategies and programme as described below:

Policy / National strategy	Objective, Programme / Ongoing action or implementation
National land policy	National development and application of regrouped habitat policy

Rwanda Vision 2020	National land development and basic infrastructure development
	Sustainable water resources management
	Reduction of the percentage of the use wood energy in the national energy programme from 94% to 60% in 2010 and 50% in the year 2020
	Reduction of the percentage of the population involved in the primary sector of agriculture from 90% to less than 50% in the year 2020
Poverty reduction strategy	Development of socio-economic infrastructures (water, energy, fight against erosion) Promotion of activities (agro-pastoral, craft industry or HIMO)
National energy policy	Strategy to promote alternative energy

DESCRIPTION

Global objective

Stimulate regrouped rural habitat through improved basic services in Imidugudu villages in vulnerable zones and reduce exposure of rural population to climate change.

Specific objective

- Increase access to drinking water and waste water sanitation in Imidugudu villages of vulnerable zones;
- Supply electricity through utilization of alternative energies so as to reduce deforestation of vulnerable zones and the rate of wood energy utilization in the national energy programme;
- Reinforce professional capacities of the population and creation of agricultural and non agricultural employments;
- Creation of a favorable environment to non-agricultural investments.

Project components

- Identification of Imidugudu villages in zones vulnerable to climate change;
- Preparation of a drinking water supply, sanitation and alternative energy project in this villages;
- Preparation of an invitation to tender document for the execution of project in three Imidugudu villages pilot project;
- Follow up of activities in the three pilot villages;
- Training and sensitization of the population on the economic use of water and energy;
- Reinforcement of land preservation capacities, fight against erosion and of irrigation;
- Promotion of activities for support and professional training;
- Global follow up and evaluation of project..

Expected results

- Services of drinking water, sanitation and alternative energy are operational and well maintained in the three villages Imidugudu pilot project and the acquired experience kept;
- The village population increases due to the coming of new families;

- Participating people possess the needed professional competence in different sectors of agricultural and non agricultural and non agricultural activities and have employments;
- The increase of income of the beneficiaries is realised.

Beneficiaries

Population of villages Imidugudu from the East, South East, North and Western regions.

Implementing agencies

- Project coordination;
- MINITERE,
- MININFRA,
- ELECTROGAZ,
- Districts of vulnerable zones,
- RWARRI,
- MINICOM,
- CDF,
- REMA,
- Micro finance institutions.

Follow-up and evaluation

Institution: Project coordination, pilot and steering committees, concerned districts, beneficiaries and donors.

Frequency: Term and annual.

Type: Physical and Financial.

Methods: Reports with performance indicators, seminars, field visits.

Risks and barriers

- Weak capacity of coordination for concerned services in the optional choice of technical solutions and project planning for drinking water installations, sanitation and alternative energy for each village;
- Reception capacity and extension of each village is difficult to evaluate;
- Weak capacity of follow up during the execution of works at the level of the three pilot villages;
- At village level, keeping trained staff for the managing of installations difficult;
- Interest of weak people for the training and reinforcement of professional capacities;
- Difficult access to product market and sale of services.

Duration

4 years

Period

2007 – 2011

Cost

USD 1,650,000

RWANDA

NAPA PRIORITY PROJECT N° 6

INCREASE MODES OF FOOD DISTRIBUTION AND HEALTH SUPPORT TO FACE EXTREME CLIMATE PHENOMENA

LOCALISATION

Vulnerable regions of East, South East, North and West

RATIONALE

The implementation of projects meant to reduce vulnerability and increase the capacity of population adaptation to climate change (including climate variability and extremes) require some time to reach results, hence the need to start them and their emergency to start immediately.

However, uncertainty in the evolution of climate phenomena through their probability of occurrence such as droughts and floods added to the very precarious situation of these rural population vulnerable regions requires a strong attention for the organization of rescue and food products in particular during climate catastrophes.

This project is meant to support national and provincial efforts to increase the modes and means of food distribution and health support during these catastrophes. This project in itself should be considered as a complimentary component at the same time to activities of national risks and catastrophe management service and of the project to be eventually undertaken and which shall concern the implementation of information system and hydro-agro-meteorological alert and rapid intervention.

INTEGRATION

This project is part of the programme planned by risks and catastrophe management policy as well as in the poverty reduction strategy. The link existing between this project and this programme are detailed below:

Policy / National strategy	Objective, Programme / Undergoing actions of planning or implementation
Risks and catastrophe management policy	Risks and catastrophe management national plan
	Development of information and early warning systems
	Integrated management of basins and fight against reduction of natural water reservoirs
Poverty reduction strategy	Identification of major problems facing the community

DESCRIPTION

Global objective

Increase Rwanda's capacity to fight effects on the population from catastrophes due to climate change including climate variability and extremes.

Specific objectives

- Increase national, provincial and district organizational capacity to manage food and medical stocks and manage crisis due to famine for health support;

- Increase national, provincial and district capacity to define and implement best means and modes of food products and medicine distribution in the regions affected by climate catastrophes.

Project components

1. Analyze the current organizational management of food and medical stocks at national, provincial and district levels;
2. Analyze the quality and quantity of current food and medical stocks at different levels;
3. Formulation and implementation of recommendations for the choice of the best organizational means and modes of food products and medicines in the identified vulnerable regions.

Expected results

- Analysis of organizational capacity in the management of food and medical stocks is carried out and recommendations implemented up to the level of districts recognized as vulnerable;
- The implementation of recommendations also centers on communication means, transport and frigorific installations and stocking;
- Intervention plan is set up and regularly tested.

Beneficiaries

Poor and destitute population in vulnerable regions affected by climate catastrophes.

Implementing agencies

- Project coordination;
- MINICOM;
- MINITERE;
- MININFRA;
- Districts, Provinces;
- Decentralized administrative structures (provinces and districts) for risks and Catastrophe management;
- REMA.

Follow-up and evaluation

Institution: Project team, pilot and steering committee, donors

Frequency: Term and annual

Type: Physical and financial

Methods: Reports with performance indicators, seminars, field visits

Risks and barriers

1. The management of recommendations organizational means and management up to the level of vulnerable districts risks to be rejected among other priorities of the country;
2. Lack of financial and human means for installation and frigorific infrastructures and stocking;
3. Lack of means for acquisition and maintenance of communication and transport of food products and medicine.

Duration

2 years

Period

2007 - 2009

COST

USD 850,000

SAMOA

NAPA PRIORITY PROJECT 6

PROJECT PROFILE 6: ZONING & STRATEGIC MANAGEMENT PLANNING PROJECT

IMPLEMENT ZONING AND STRATEGIC MANAGEMENT PLANNING

Apia, the capital of Samoa centers all utility services and operations. The 2001 Population census claimed that 22% of the total population resides in the Apia Urban Area. Its coastal location makes infrastructure and government assets vulnerable to storm tides and strong northerly winds which are dominant in the event of tropical cyclones.

The implications of urban growth in Apia and its adjoining areas will continue to rise without an integrated strategic response, and its growth corridor to North West Upolu will be pressured to accommodate such growth. These patterns of growth will lead to continued pressure on resources of Apia as well as continued economic, social and environmental change within the wider regions of the country. In this context, the unplanned expansion of Apia cannot be ignored as urban environmental problems continue to rise. The range of issues predominant includes:

- Domestic and industrial waste disposal;
- Overcrowding and privacy issues associated with sitting new houses;
- Flooding caused by building on flood prone and poorly drained lands;
- Dead animals such as cattle and dogs;
- Reclamation of coastal lands and destruction of mangroves;
- Septic tank effluent flowing into the groundwater and coastal ecosystems;
- Urban catchments impacts on water quality and land resources.

The *Planning and Urban Management Act 2004* (the “PUM Act”) has provided legal grounds to implement an integrated system of urban management and planning for sustainable development and environmental management. It considers a holistic approach to achieving the planning and The Apia urban area is rapidly growing, dominating the settlement pattern in Samoa with over 350 smaller rural villages supporting it (ADB/GoS, 2001). The more prevalent type of urban development occurs along coastal areas that can be serviced by existing infrastructures (roads).

Villages are growing rapidly in the hinterland, stretching to the extent of their village boundaries. As a result, villages now form one linear strip of urban development between Apia and Faleolo. The same pattern is also evident in Salelologa on the south-eastern Savai’i but on a considerably smaller scale. The benefits of being closest to national infrastructure that provide urban services or transportation, electricity, telecommunications, has led to a shift in village set-ups in the urban area. The disadvantage of this centralization of services in Apia and the preference to be along the coast for services and food security placed these infrastructure and communities in a very vulnerable situation to sea level and extreme weather events like Tropical cyclones.

RATIONALE

Apia urban area is where the greatest stresses on the environment are generated and pronounced. The changing context in which Apia and Samoa is evolving, places

new pressures on all sectors engaged in urban management and regional development and the built and natural environments. The complexity and interrelationships of issues facing Samoa today lie far beyond the simple planning frameworks, but in recognizing the potential complex and interrelated impacts of climate change cross-sectoral planners need to address.

When the effects of land use practices are considered, the human impact on climate change may be greater than previously thought. If land use is a major factor in global warming, this raises difficulties for anyone attempting to deal with the issue, most land use questions are raised and resolved at the local level, while climate issues are often discussed at both national and international institutions.

Current land use practices are altering the climate in ways comparable to the greenhouse effect produced by carbon dioxide gas released into the atmosphere. One major component is the construction of concrete urban buildings, which store heat during the day and release it at night the well-known "urban-heat-island" effect. Retained heat from concrete buildings and streets increases night time temperatures, though it results in a slight decrease in maximum temperatures.

The implications for local land use planning, is an important aspect that must be considered to understanding climate variability and change at the local scale. It would be useful to examine specific locations to observe if they are being influenced by local land use changes (e.g. buildings, parking lots). Hence the need for clear delineation between land use activities and the use of performance standards is required to ensure that activities have minor impacts on the urban and rural environments.

Table 1: Planning and Development Management Tools

	DEVELOPMENT MANAGEMENT TOOLS					
GOALS	Urban Growth Boundary (UGB)	Zoning	Sustainable Management Plans	National Building Code 1992	Draft EIA Regulations 1998	Coastal Hazard Zone
Environment To increase and strengthen adaptive capacity		√	√		√	√
Urban Intensification Improved urban center, promoting attractive design and heritage	√	√	√	√	√	√
Strong and Healthy Communities Community and villages that meets its needs		√	√	√		√

The importance of development tools identified as zoning in Table 1, is a way the government can control the physical development of land and identifies the permissible use(s) for each individual property.

Zoning typically specifies the areas in which residential, industrial, recreational or commercial activities may develop. For example, a residential zone might allow only single-family homes as opposed to apartment complexes. On the other hand, a commercial zone might be zoned to permit only certain commercial or industrial uses in one area, but permit a mix of housing and businesses in another location. Zoning

will be more appropriately addressed in the Sustainable Management Plan which may have a combination of statutory and non-statutory guidance that determine what development standards and terms for land use activities are permitted in an area.

PUMA will have to consider developments (eg structures) which are:

- Adaptable, flexible and movable;
- Performance criteria may have to demonstrate ability to respond to changing sea levels;
- The availability of water;
- Resilience to extreme storm events and elevated extreme temperatures for extended periods.

DESCRIPTION

Key Objectives

To implement a phased and flexible approach to the adaptation of development tools to address the impacts of climate change;

1. To integrate climate change policies and methods into all Sustainable Management Plans (SMPs) at national, regional, district and site specific levels;
2. To mainstream climate change policy into the planning and urban management agency's plans, policies and development assessment reports.

Expected Outcomes

- National or regional SMPs that advocate improved built and natural environment via the implementation of development management tools identified;
- Achieve sustainable development;
- Increased resilience of built and natural environment to expected climate change and sea level rise;
- Strengthen and increase awareness amongst planners, communities, service providers, politicians and division and policy makers;
- Integration of climate change factors into development consent processes and environmental impacts assessments

Suggested Actions Required	Indicators / Expected Outputs	Potential Long-term Outcomes
Develop a detailed sustainable management plan and implementation of action plan	National, District and Local Sustainable Management Plan Buffering mechanisms; Reviewed and updated existing regulation and policies.	National or Regional Sustainable Management Plans that advocate improved built and natural environment via the implementation of development management tools identified; Adaptation to climate change are mainstreamed into development management tools of PUMA; Help achieve sustainable development goals.
Develop priorities for plan and policy development		
Identify priority for urban improvement and urban development		

IMPLEMENTATION

Institutional Arrangement

Implementing Agency: MNREM

Coordinating Agency: MNREM, Project Steering Committee (Advisory Committee)
An Advisory Committee shall be responsible for discussing and making decisions and recommendations on issues and subjects including, but not necessarily limited to:

1. Inputs on the best ways to improve on Sustainable Management Plans;
2. Advise on the possible ways to engage broad-based consultation and awareness;
3. Assist with consultations of project profile;
4. Review of project profile as circumstances changes.

The reporting relationship is seen as the Advisory Committee is a sub-committee of the Planning and Urban Management Board (“the Board”) and the Chairperson shall report to the Board.

Risks & Barriers

- Customary land tenure system;
- Land market adaptation;
- Costs to consultation and preparation;
- Property rights are controlled;
- Fear of compensation;
- High land values;
- Lack of key stakeholder support;
- The data used is accurate and reliable;
- Government commitment;
- Resources are available;
- PUMA commits to implement and monitor SMPs;
- Improved SMPs will reduce the impacts on climate change.

Monitoring and Evaluation

Baseline data need to be gathered on the elements listed below in which may become land use indicators. These are as follows:

- Land use patterns;
- Urban population growth ;
- Open space in urban areas;
- Agricultural land loss;
- Impervious surfaces;
- Number of trees on public property;
- Trees lost or gained from residential or commercial development;
- Percentage of natural forest;
- Percent of new residential, commercial and industrial lots;
- Open land lost to development in square km;
- Acres of cropland that have been converted to developed land;
- Size and distribution of significant wetlands;
- New septic tank;
- Noise complaints received by PUMA.

COST

Indicative Budget

<p><i>Proposed Funding (Technical Assistance): USD 400,000</i></p>
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Activity	Costs (USD)
Develop a detailed sustainable management plan and implementation of action plan	200 000
Develop priorities for plan and policy development	100 000
Identify priority for urban improvement and urban development	50 000
Review existing regulation and policies to allow integration of adaptation to climate change into development management tools	50 000
TOTAL	400 000

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.

SAMOA

NAPA PRIORITY PROJECT 8

PROJECT PROFILE 8: ESTABLISHING CONSERVATION PROGRAMS IN HIGHLY VULNERABLE MARINE & TERRESTRIAL AREAS OF COMMUNITIES PROJECT

TO ESTABLISH AND OR STRENGTHEN COMMUNITY-BASED CONSERVATION PROGRAMS FOR THE PROTECTION OF HIGHLY VULNERABLE TERRESTRIAL AND MARINE BIODIVERSITY

The islands are defenseless against the devastating natural disasters, including cyclones, tidal waves, sea level rise and volcanic eruptions. A significant cyclone can wipe out an entire ecosystem in a short time by generating catastrophic waves, torrential rains, and winds up to 240 kilometers an hour. Biodiversity habitats are prone to tropical cyclones, forest fires in the situation of drought and human induced deforestation activities.

In general as stated in Samoa's Biodiversity Strategy and Action Plan (NBSAP, 2001) the 'status of wildlife' in Samoa after severe cyclones like Ofa and Val was 'quite critical', most likely many of the species were predicted to 'survive albeit in very reduced numbers' (ibid., 2001) with some being severely 'threatened in the long-term should additional pressures such as hunting be at unsustainable levels' (ibid., 2001). It was generally then recommended from the assessments of the NBSAP report that the 'best solution is to ensure there is sufficient habitat which will provide some surviving refuges' (ibid., 2001) for wildlife fauna in particular the birds and fruit-eating bats. Recent studies shows that most of the coast line of Samoa's major islands are of gradual sloping low-lying areas settled by more than 70% of the country's population are highly vulnerable to tropical cyclone induced waves causing coastal flooding, erosion and landslides (First National Communication Report, 1999).

The impact on marine resources has been great. The intense wave activity of storms overturned much of the coral near shore and severely damaged corals to depth of up to 10 meters (30ft). More recently a mass of coral bleaching event affected most of the coral in the Samoan archipelago and scientist's now associate coral bleaching with global warming. Corals, as the main habitat for marine fish life, live at or between 18 – 28 degrees Celsius therefore a slight increase in temperature of the water causes bleaching. There had been evidence of coral bleaching in Samoa during strong La Nina episodes.

RATIONALE

The identification of conservation areas in highly vulnerable marine and terrestrial areas of communities is urgent and must be addressed immediately. Compounding biodiversity, the pockets of vulnerable marine and terrestrial areas of communities must be protected in order to treasure its biodiversity, safeguard the sustainability of natural resources and environment of the communities. This will ensure an increasing adaptation capacity of the communities, mainly the livelihood resources.

A collaborative effort between the communities and the implementing and coordinating agencies will improve sustainable biodiversity management considering climate change and climate variability. Furthermore, conservation will be given to priority conservation sites for priority species protection. A continued commitment by the communities along with the implementing agency to establish a biodiversity

inventory assessment of the ecological status of key priority sites key fauna and flora species for conservation as well as the pressures affecting the sustainability of the site and its biodiversity content will ensure the project impacts can be measured and further adaptation initiatives can be formulated to better adapt at the community level.

DESCRIPTION

Key Objectives

1. Strengthen sustainable biodiversity management plan of action in the communities;
2. Strengthen high priority conservation areas in communities;
3. Develop and update data base inventory for assessment, monitoring and evaluation works;
4. Develop a systemic awareness programme to advance and maintain traditional and modern biodiversity management plans and practices.

Expected Outcomes

- Existence of a sustainable biodiversity management plan in the communities at end of the project;
- Existence of high priority conservation areas identified and marked in communities;
- An inventory database located and accessible for assessment, monitoring and evaluation works;
- A systematic programme of educational and practical learning in which communities engage in improving their knowledge, skills and commitment to better biodiversity management practices.

Suggested Actions Required	Indicators / Expected Outputs	Potential Long-term Outcomes
Develop community-based sustainable biodiversity management plans	A community-based sustainable biodiversity management plan that allows the community to better manage its biodiversity resources of priority concern;	Existence of a sustainable biodiversity management plan in the communities at end of project;
Identify and establish priority conservation areas for priority species protection (both marine and terrestrial)	Display of priority Conservation Areas identified for each community;	Existence of high priority conservation areas identified marked in communities for public notice ongoing after project;
Develop a community-based biodiversity inventory	An inventory of the communities biodiversity allowing assessment to identify priority areas for further conservation and protection.	A database inventory located and accessible within the community for assessment and monitoring and evaluation works.
Develop effective capacity building programmes for communities with conservation area programmes		

IMPLEMENTATION

Institutional Arrangements

Implementing Agencies: MNREM and MOA in close collaboration with communities

Coordinating Agency: Project Steering Committee (acting advisory committee)

MNREM is the most suitable national agency to implement this project profile. It is proposed that MNREM will undertake the above mentioned activities in close

collaboration with the communities that require urgent and immediate attention of conserving their biodiversity.

The project will be coordinated by the Climate Change Unit of MNREM with close collaboration with the project steering committee. This Steering committee consists of executive level officers of each government ministry and private stakeholders who will oversee the articulation of funding received to implement these activities as well as other technical related matters

Monitoring and Evaluation

The Project Steering Committee will oversee the vulnerable and adaptation strategies executed by the implementing agency and monitor the results of the project in terms of:

- A sustainable biodiversity management plan of the communities exists and is practiced continually before and after seasons
- High priority conservation areas are well identified marked and displayed on public notice boards within critical areas of the community environment.
- 6 monthly update of village or community-based biodiversity inventory.

Risks and Barriers

- **Inadequate Level of Available Resources.** There is at present a great need for effective holistic approach towards education, awareness, and training to the capacity of villagers to commit to this work in integration with their other social and economic needs. In particular, the majority of the biodiversity related conservation work required should be carried out at the local community level. An extensive outlay of financial and human resources is therefore required.
- **Legislative Framework.** There is no legal basis provided for village communities establishment of protected or conservation areas.
- **Lack of Effective Information Management System.** Whilst numerous surveys have been undertaken in different fields, the results have not been able to be integrated. An integrative information management system would give people and communities much broader outlines of issues and problems in biodiversity conservation and in other areas of development.
- **Absence of Effective Institutional Arrangements in Local Communities.** This refers to both the quality and quantity of the governors, the governed and the governing structures at the village level. There are various resources needed to increase the capacity and scope of action of these elements of institutional arrangements or governance at the local levels in order to effectively incorporate in their decision- making processes biodiversity and other issues at the level of urgency now required from them.

COST

Indicative Budget

Proposed Funding (Technical Assistance): USD 350,000

Activity	Costs (USD)
Develop community-based sustainable biodiversity management	125 000

plans	
Identify and establish priority conservation areas for priority species protection (both marine and terrestrial)	75 000
Develop a community-based biodiversity inventory	100 000
Develop effective capacity building programmes for communities with conservation area programmes	50 000
TOTAL	350 000

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

NAPA PRIORITY PROJECT NO. 17
WATER AND ENERGY SECTORS PROJECT 4
SUSTAINABLE MANAGEMENT OF WATER AND ENERGY

Location: The whole country.
Sector: Energy and Water.

JUSTIFICATION

The water, the electricity and the firewood are very badly managed in STP. Relatively to the water, a great waste exists, namely in the public fountains. As for the electricity, a lot of fraud exists. Regarding to firewood, that is the type of older energy, it is wasted. Therefore, the use of new technologies and the improvement of management will allow sustainable management of those resources.

DESCRIPTION

Objective

Reduction of wastes and better use of the available resources.

Activities

Collect and treatment of data; Technological innovations and sensitization of population.

Contributions

State santomense, NGOs, civil society, international organizations.

Short term results

Reduction of losses. Reduction of consumption of that fossil fuel in the electricity production.

Expected results

Profitability of country resources.

IMPLEMENTATION

Institutional Framework

Project to be managed by DRNE, EMAE and Forests sector.

Risks and obstacles:

Institutional obstacles.

Control

DRNE, Forests sector.

Indicators

Losses

Actual value

The existent losses, only in public systems of water supply and energy, is approximately 40%. as for firewood, it is ignored the value of the losses.

Source

EMAE.data

Value to reach

To reach values of 10-15% of total losses in the distribution of drinking water and energy.

COST

USD 300,000

SIERRA LEONE

NAPA PRIORITY PROJECT NO 6

DEVELOPMENT OF AN INTEGRATED NATURAL RESOURCES AND ENVIRONMENTAL MANAGEMENT SYSTEM FOR SIERRA LEONE.

RATIONAL/JUSTIFICATION

A judicious and carefully planned and implemented integrated management of the Natural environment and resources can contribute immensely to reduction of the impacts of climate change on agriculture and food security. It is also an initiative for poverty reduction.

The current poor status of the country's natural resources is attributed to the following constraints:

- Lack of financial, technical, institutional and other logistics support to community base organizational intervention. This has led to reduced productivity and consequent environmental degradation.

Some of the causes of land degradation are:

- Cultivation of steep slopes;
- Bush fallow cultivation with shortened fallow periods;
- Firewood and charcoal harvesting;
- Existence of bare soils, ponds, lakes and grasslands in mining areas previously covered with fertile soil and forests;
- Inadequate extension service and facilities;
- Lack of environment impact assessment in project planning and implementation. Etc.

The strategies of the project in Addressing the above issues will be as follows:

- Inventory and mapping of degraded lands;
- Participatory rapid Assessment (PRA) of socio-economic issues.

Based on the outcomes of the above strategies the project will:

- Promote adoption of proper land husbandry and other resource management.

Description of the Project objectives:

- To promote community based (CBO) approach in agricultural development and environmental management;
- To conduct a natural resources inventory and mapping of degraded areas;
- To promote capacity building;
- To review existing environmental and resource use policies and regulation;
- Off-farm land and natural resource management;
- Promote protected area management activities.

Activities

- Acquisition of sources of data and other resource materials;
- Acquisition of survey equipment;
- Acquisition of means of mobility;
- Assembly of camping materials;
- Recruitment of specialized staff and non specialized staff;
- Development of natural resource data bank;

- Provision of storage facilities;
- Conducting of capacity building;
- Planning and implementing soil and conservation measure at National, Regional and farm levels;
- Establishments of protected forestry areas, conducting wetland biodiversity assessment and mapping;
- Rehabilitation of degraded areas;
- Conducting environment impact assessment for future development projects;
- Collaborative management and utilization of forest area.

Inputs

- Maps, aerial photos, satellite imagery;
- Survey equipment;
- Vehicles, motor bikes, bicycles;
- Camping materials;
- Specialized staff (consultant), casual labour);
- Storage facilities;
- Training materials and equipment;
- GIS hard and soft ware;
- Trained forest guards;
- Seeds and other planting materials.

Outputs

Short-term outputs

- Employment for local communities;
- Capacity building;
- Social and economic life for communities improved increased incomes;
- Food self sufficiency and energy production;
- Increased awareness about the importance of natural resource preservation;
- Reduced land degradation.

Long term outputs

- Increased chance of adaptability to climate change;
- Availability of a data base of Natural resources;
- Well trained and motivated extension and technical staff;
- Appropriate environmental protection policies which are effectively implemented.

IMPLEMENTATION

Institutional Arrangement

- The implementation will require total involvement of the whole nation with special emphasis on participatory approach;
- Total collaboration of researchers with land users; mainly community based organizations;
- Government: to provide generous funding, formulate, enforce the implementation of policies;
- Government to encourage and promote the involvement of the private sector;
- Strengthening all national regional and local institution dealing with natural resource preservation;

- The ministry of Agriculture and NACFF to develop policies.

Risks and Barriers

- The bush fallow systems/shifting cultivation;
- Uncontrolled land use activities e.g. mining, logging, fuel wood and charcoal production;
- Low level of funding;
- Illiteracy amongst the rural population.

Monitoring and Evaluation

The ministry of agriculture and the national commission on environment and forestry will be lead agencies ensuring monitoring and evaluation of the natural resource development efforts, at all administrative levels.

COST

Estimated at USD 1,265,000

Budget Breakdown for natural resource management project USD, '000

Activity/Items	Y1	Y2	Y3	Y4	Y5
Inventory and survey of natural resource	60	40	30	10	10
Acquisition of resource materials and other logistics	60	20	20	20	-
Creation of data base on natural resources	50	25	25	10	10
Organization of community based organization	20	20	10	10	-
Capacity building training of community members and technicians equipment	50	50	50	25	25
Sensitization and awareness creation activities	10	10	5	5	5
Soil and water conservation activities	100	100	100	25	25
Monitoring and evaluation	210	10	5	5	-
Total	560	275	245	110	75

SIERRA LEONE

NAPA PRIORITY PROJECT NO 19

DEVELOP AND ENACT APPROPRIATE POLICIES AND REGULATIONS RELEVANT TO THE DEVELOPMENT OF COASTAL COMMUNITIES, URBAN GROWTH PLANNING, AND CRITICAL COASTAL ECOSYSTEMS PRESERVATION.

RATIONALE/JUSTIFICATION

Regarding national coastal maritime legislation, Sierra Leone has a number of Acts. The fisheries Management and Development Act (1988) provides the framework for the regulation of fishing activities both coastal and marine.

There are also other legislations (Acts) which contains some elements relating to the management and protection of coastal resources. The Forestry Act Provides for the managements and development of all forest resources including coastal forests e.g. mangroves. The wildlife Conservation Act (1982) sets a legal framework for the protection of wildlife and creation of protected areas in the country. The Mining Act controls all land-based mining activities. The Environment Protection Act (2000) makes reference to the coastal environment. An Environmental Impact Assessments (EIA) is mandatory for any scheduled development project falling within a certain category of projects in the zone.

The activities in the coastal zone of Sierra Leone are controlled by policies, legislations and institutions of the various sectors of the economy. There is no framework for coordination, planning and management of these activities on an integrated basis. This sectorally planned approach to the management and exploitation of coastal resources has created conflict in a number of instances. For example, mangrove forests fall under the jurisdiction of the Ministry of Agriculture, Forestry and the Environment. Agricultural and forestry activities are therefore carried out without taking cognizance of the effect of these activities on the fishing industry as mangroves play a vital role in supporting health stocks of coastal fisheries. There are numerous other such examples of conflict. It is therefore obvious that as developmental activities in the coastal zone continue to increase a policy and legislative framework will be necessary for effective management of the coastal resources as well as the coastal environment. However, for policies and legislations to be effective, a sound institutional framework to implement government policies is essential, Government needs the capacity not only to articulate clear policy and to set priorities, but also to coordinate and resolve conflicts. There is also the need to develop the capacity to regulate the exploitation of the resources and to enforce laws.

DESCRIPTION

Objectives

To development appropriate policies and regulations for planning growth and development of coastal community's critical coastal ecosystems preservation.

Activities

- Collect and compile information on the present situation regarding planning growth and development of coastal communities;
- Organize workshops to:

- Present information on planning of coastal communities;
- Identity national goals on settlement planning;
- Outline the rational for the development of appropriate plans, policies and the enactment of relevant regulations for the preservation of critical coastal ecosystems;
- To review present plans, policies and legislations.

Short Term Outputs

- · Information on present policies and plans relating to the development of the coastal zone collected and compiled;
- · Present plans, policies and legislations reviewed.

IMPLEMENTATION

The project will be executed by the various stakeholders with government playing a leading role (National Coastal Area Management Board).

Risks and Barriers

- · Inadequate financial resources;
- · Inadequate trained personnel;
- · Inadequate institutional capacity.

Monitoring and Evaluation

Monitoring and evaluation will be carried out by any competent independent agency.

COST

USD 60,000

Budget Breakdown

	Year 1	Year 2	Year 3
Stock taking, Inventory of available information, field visits, interviews	10 000	-	-
Regional and National Workshops, Stakeholder consultations	30 000	-	-
Review of present plans, policies and legislations	10 000	-	-
Services of meetings (Technical and steering committees)	10 000	-	-
Report preparation and dissemination of policy document	10 000	-	-

SOLOMON ISLANDS

NAPA PRIORITY PROJECT NO. 1

MANAGING THE IMPACTS OF, AND ENHANCING RESILIENCE TO, CLIMATE CHANGE AND SEA-LEVEL RISE, ON AGRICULTURE AND FOOD SECURITY, WATER SUPPLY AND SANITATION, HUMAN SETTLEMENTS AND HUMAN HEALTH.

Goal

To increase the adaptive capacity and resilience of key vulnerable sectors

Rationale

The NAPA process has emphasized that adverse impacts of climate change in Solomon Islands will be felt in critical human systems affecting agriculture and food security, water supply and sanitation, human settlements and human health. These vulnerabilities are being exacerbated by lack of understanding, awareness and information regarding the adverse impacts of climate change and consequent sea-level rise. Most communities will be able to withstand and/or cope with negative effects of climate change and sea-level rise if they can better understand and are aware of the linkages between their experiential evidence of effects of climate change on the key sectors they depend on. Thus information will enable informed decision-making in respect of adaptation strategies, measures and actions.

Description

The adverse impacts on agriculture and food security are a major concern for many communities and/or villages. Evidence from changes in temperature and rainfall and the occurrence of tropical cyclones in Solomon Islands will have long-term effects on food production systems. These are likely to be exacerbated by the climate change and sea-level rise. Some of the impacts of concern are: increased intensity and frequency of tropical cyclones (e.g. Cyclone Namu destroyed rice industry in 1986); occurrence of pests and diseases; storm surges and flooding; sea-level rise and coastal erosion and inundation; increased temperatures; drought and ENSO-related changes to temperature and rainfall.

Water resources will also be affected immensely by climate change and sea-level rise. Adequate water supply is considered one of the key elements of food security and therefore directly linked to people's livelihood. Thus any change in rainfall will trigger changes in water supply. Water supply in Solomon Islands is sourced mainly from rivers and streams originating in

high mountain and dense forest catchments on high islands, rainwater harvesting (especially on artificial islands) and from thin freshwater lens of underground aquifers on small low-lying atolls and islands. These sources will be affected by climate change and sea-level rise on both high and low-lying islands. Information provided by communities and/or villages indicate that they are already experiencing contamination of their freshwater sources by rising sea levels (low-lying atolls), water shortages, saltwater intrusion and flooding of rivers and streams.

Closely associated with adequate water supply is the potential for declining quality of water related to unsanitary conditions. Communities and/or villages have often mentioned that sanitation is of great concern to settlements on low-lying coastal areas, islands and atolls. The human sewage, household and other debris is often washed up on public areas during flooding, storm surge, and coastal erosion associated with tropical storms. Wave storms and flooding also contaminates potable water and together with human sewage and debris pose a serious health risk to the communities and/or villages.

Droughts in Solomon Islands have caused serious shortages of water supplies. For example the 1997/1998 ENSO had caused reduction of water supplies by 30-40% in Honiara. Flooding also causes serious health risks. For example an increase in urban flooding undermines the water quality of town water supply and services as well as water infrastructure. Saltwater intrusion and sea-level rise has caused damage to water infrastructure and contaminated freshwater supplies.

Education, awareness and information on climate change impacts targeted to the needs and interests of the community are important tools to raise awareness of the impacts on water supply and on how to protect water supplies in the event of a climate extreme. Awareness raising and training will be focused at the central government level to help facilitate the inclusion of adaptation strategies to protect water in nation plans and budgets.

Awareness-raising with key stakeholders across the country is also needed such as for water services providers when discussing the rationale for any planned changes in the groundwater extraction rate for town water supplies. The Disaster Management Office continues to facilitate awareness programs through the local radio to promote education and awareness of various disasters to the general public and preparedness for such disasters should they occur.

This project is divided into five components focusing on the respective highly ranked priorities (agriculture and food security; water supply and sanitation; education, awareness and information; human settlements; and human health).

Component 1: Agriculture and Food Security

Objectives

The main objective of this component is to “increase the resilience of food production and enhance food security to the impacts of climate change and sea-level rise.”

This project will ensure that the future food security and food production is maintained in a sustainable manner. The project will facilitate the development and implementation of the following key priorities for food production and food security in the country:

- a) National Food Security programme - The food security issue is common to all service providers in the agriculture sector.
- b) Provincial Food Banks - To mitigate and prepare against the effects of climate change such as cyclones, tsunamis, floods, and pest outbreaks, provincial food banks must be established at strategic sites.
- c) Crop diversification - The introduction of various crops to boost food production and economic development in the country must continue. This activity can be done by all players in agriculture development.
- d) Tolerant crop species – salt, drought, high rainfall, etc. - Crop varieties that are tolerant to extreme effects of climate change must be identified and rapidly propagated and distributed to hot spots.
- e) Rapid Response to disasters – exotic pests and diseases outbreaks, floods - An agriculture rapid response center must be established to prepare for any disasters such as pest and disease outbreaks.
- f) Weather forecasting- Predicting outbreaks of pest and diseases on crops -Developing capacity and capability to predict weather patterns such as weather simulations and pest and disease outbreaks would reduce crop losses.
- g) Weather stations establishment at agriculture production areas - The establishment of weather stations at agriculture field stations would ensure that data on rainfall, sunlight, and temperature are kept. This information is critical for crop production.
- h) National Urban Fruit Tree Planting - Planting fruit trees in urban centers such as Honiara, Auki, Gizo, Kirakira, Buala, Lata, Taro, Tulagi, and Tingoa. This will serve two purposes; as a source of fresh fruits and as beautification of the towns.

Outcome 1: Increased production of food crops in small islands' communities/villages

Outputs:

- 1.1 ARABLE LAND IMPROVED AND REHABILITATED
- 1.2 Coastal/flood protection systems constructed

- 1.3 Seawall/access roads and other protective systems upgraded and developed.
- 1.4 Organic composting encouraged and soil fertility maintenance improved
- 1.5 Diversification of food crops with a focus on improving access to foods promoted and used - e.g. introduction of salt-tolerant and high-yielding crop varieties
- 1.6 Food storage infrastructure and/or facilities constructed.
- 1.7 Food security program and extension services established
- 1.8 Important fruit trees are replanted and protected.
- 1.9 Capacity built for financial planning to manage family assets in times of food shortage

Outcome 2: Enhanced self-reliance and food security preparedness

Outputs:

- 2.1 Access to income generation and markets improved.
- 2.2 Small-scale income generation activities (e.g. retail and wholesale business) encouraged and promoted.
- 2.3 Diversification of crops.
- 2.4 Information on other business opportunities and income-generating activities disseminated.
- 2.5 Food banks established
- 2.6 Training of small-scale entrepreneurs provided and up-skilled

Outcome 3: Sustainable land management

Outputs:

- 3.1 Impacts of saltwater intrusion, droughts and floods, sea-level rise, salt spray, storminess managed and understood.
- 3.2 Soil fertility management improved.
- 3.3 Food crops, tree crops, livestock, cash and subsistence crops managed
- 3.4 Climate-resilient farming techniques and sustainable agriculture developed used.
- 3.5 Climate change adaptation and mitigation incorporated into development planning.
- 3.6 Sustainable agriculture promoted.

Outcome 4: Improved early warning system and improved agricultural information

Outputs:

- 4.1 Rapid response mechanism for responding to natural disasters developed.
- 4.2 Weather forecasting and information for farmers improved.
- 4.3 Weather stations in agricultural production areas established.
- 4.4 Training of adaptation experts in extension teams.
- 4.5 Implementation of pilot projects in local communities – rainwater harvesting, measures to reduce soil erosion, changes to design of reservoirs and irrigation channels to prevent risks from peak flows.
- 4.6 Dissemination of lessons learned at national and international levels

Outcome 5: Provision of effective climate information products and services to land and water resources managers.

- 5.1 Communication of climate information products and services strengthened
- 5.2 Farmers, land and water managers educated and trained on various decision-support tools.
- 5.3 The linkages between national meteorological and hydrological services and land and water managers strengthened.
- 5.4 Emergency toolkits for land and water resources management developed.
- 5.5 Agriculture, forest, and water managers trained to integrate climate change adaptation and mitigation.
- 5.6 National meteorological and hydrological services strengthened.
- 5.7 Public awareness and information on climate change impacts on food production heightened.

Component 2: Water Supply and Sanitation

The main objective is to increase the resilience of water resources management to impacts of climate change and sea-level rise.

The impact of sea-level rise will be strongly affected by human responses to the risks. The areas which are most vulnerable to sea-level rise are low-lying islands, atolls and flat deltaic regions at the mouth of larger rivers. Studies suggest that hundreds of small islands could permanently inundate and their cultural heritage lost in the event of a one meter sea-level rise. Intrusion of salt water from rise in sea level affect groundwater resources, especially small atolls and low-lying islands which rely on rainfall or groundwater for water supplies.

Incorporation of climate change considerations into the planning and design of infrastructures both urban and rural would assist in the mitigation against hazards and adaptation to climate change. Integrating climate change as formal considerations in the planning, design, construction, operation and management of water resources projects should be a government policy in order to mitigate and adapt to impact of climate change.

The overall objective of the water resources programme is to apply hydrology to meet the needs for sustainable development and use of water and related resources; to the mitigation of water-related disasters; and, to effective environmental management in the country. The government recognises that safe drinking water and proper sanitation facilities are basic necessities to better health. Basic water resources assessment program should support activities related to the impacts of climate change and variability and climate related extremes in Solomon Islands. These programs include:

- a) Promoting activities in operational hydrology to further hydrological services in Solomon Islands through the collection, processing, storage, retrieval and publication of hydrological data, including data on the quantity and quality of both surface water and groundwater; the provision of such data and related information for use in planning and operating water resources projects to meet the needs for sustainable development and use of water and related resources to benefit rural communities; to the mitigation of water and climate change related disasters; the provision of appropriate water and related information to SIWA to improve its service delivery and to provide for effective water resources and environmental management in Solomon Islands.
- b) Program on capacity building in hydrology and water resources should provide a framework by which national hydrological services can seek advice and assistance and provide support to efforts to build capacities to serve the country including the education and training of staff, increasing public awareness of the importance of hydrological work, impacts of climate change and support to technical cooperation activities.

Outcome 1: Integrate water conservation and sustainable water resources management in all sectors and communities.

Outputs:

- 1.1. Construction of village/community water tanks
- 1.2. Construction of water reservoirs for institutional and residential areas.
- 1.3. Upgrading of existing reservoirs, protective structures/access roads.
- 1.4. Promote/build household rainwater harvesting.
- 1.5. Construction of strategic storage water reserve tanks.
- 1.6. Construct engineered or “climate proofed” water reservoirs.
- 1.7. Develop and implement Water Use efficiency Plan.
- 1.8. Raise awareness for water conservation.

Outcome 2: Incorporate climate change adaptation strategies into the guidelines and criteria for design and construction of appropriate water infrastructure in vulnerable areas.

Outputs:

- 2.1 Guidelines for development of water supply in rural areas developed.
- 2.2 Inventory of persistent organic pollutants (POPs) and adequate storage and leakage prevention conducted.
- 2.3 Good practice guidance for pesticide storage and use, and application developed and used.
- 2.4 Drought and its effect on water distribution in rural areas assessed.
- 2.5 Use rainwater harvesting technologies developed and used.

Outcome 3: Increased reliability and quality of water supply to all sectors and communities

Outputs:

- 3.1 Capacity of water supply increased
- 3.2 Water reticulation and distribution systems improved and where necessary constructed
- 3.3 Arable land improved and rehabilitated
- 3.4 Sustainable use of water on commercial agriculture adopted
- 3.5 Build appropriate low-technology irrigation system for farmers.
- 3.6 Diversification food crops with a focus on high-yielding crop varieties promoted.
- 3.7 Promote water conservation and water use efficiency
- 3.8 Prevent land-based pollution.

Outcome 4: Enhanced institutional and legal framework for water resources management

Outputs:

- 4.1 Individual and institutional capacity for sustainable water management built and/or enhanced.
- 4.2 Water resources sector policy developed and implemented.
- 4.3 Water resources sector legislation developed and adopted.
- 4.4 Water sector plans and programmes developed and implemented

Component 3: Human Settlement

The main objective of this component is to improve the capacity for managing impacts of climate change and sea-level rise.

Vulnerability of a community is often related to its geographic location, environment in which it is situated and availability of resources it depends on. In Solomon Islands some communities/villages are located in highly sensitive and hostile environments and resource-poor areas. The artificially-built islands of Ngongosila, Kwai, Langalanga and Lau live on the sea for many generations. The islands of Ontong Java, Sikaiana, and Reef Islands also live on low-lying atolls and are subject to the vagaries of climate change and sea-level rise. While these communities and islands have survived and adapted well to the conditions over many generations, climate change and sea-level rise have now become the most imminent threat to their survival.

Additionally, there are also communities and/or villages that have been created as a result of the British Colonial Policy in the then British Solomon Islands Protectorate which are now faced with dealing with the adverse impacts of climate change and sea-level rise. Many of these communities and/or villages are located in highly vulnerable areas.

Both groups of people (islands people and migrants) have often moved partially as a consequence of disasters as well as opportunities for employment. Such communities often have very limited resources (natural capital) and adaptation options. One of the key potential adaptation options for many of these communities and/or villages is to relocate. The question of relocation has serious political, economic and socio-cultural implications.

Given the above, the focus of this component is to enhance the capacity of such islands and communities to plan for adaptation.

Outcome 1: Completed community vulnerability and adaptation assessments.

Outputs:

- 1.1 Consultations and assessments with the communities conducted.
- 1.2 Adaptation plans for communities prepared.
- 1.3 Awareness on climate change impacts promoted and information disseminated.
- 1.4 Key vulnerabilities and adaptation options, strategies and measures identified

Outcome 2: Improved community adaptation planning

Outputs:

- 2.1 Relevant authorities are consulted
- 2.2 Relevant resources owners are consulted
- 2.3 Plan for adaptation actions adopted
- 2.4 Key community adaptations implemented

Component 4: Human Health

The main objective of this component is to increase the capacity of health professionals to address adverse impacts of climate change on human health.

In the Solomon Islands the climate change and climate variability including extremes cause adverse impacts such as floods, storm surge and tropical cyclones. Information of late has shown that climate change and variability increases the potential for increase in tuberculosis and leprosy through mobility of the population, concentration of the people in an area and poor living conditions. These conditions are exacerbated by shortage of potable water (especially on low lying islands), and poor sanitation. Water resources are often affected by storm surge and wave-overtopping while sea-level rise affects sanitation.

Another area of concern is that during high rainfalls and very high tides water and sea would flood the villages, bringing in faeces from traditional toilets (from the surrounding areas) into the villages. Helminthes and other parasites brought in through this mechanism are easily passed on to children and adults.

Rainfall is becoming more frequent causing floods and high water log in flat areas. Root crops and vegetables could not grow in such conditions. Eighty percent of this country lives in rural areas and such disaster could cripple the country with regards to health. High and intense rainfall causes respiratory infections, high parasite infections such as diarrhea.

Malaria is transmitted by mosquito and mosquito's life cycle depends on breeding sites and humidity, both which are climate dependent. A lot of rain results in a lot of breeding sites. A lot of breeding sites means an increase in mosquito population and an increase mosquito population results in high malaria transmission. A lot of rain induces high humidity. Humidity is necessary for the survival of mosquitoes and the development of malaria parasite in them. These factors increase the efficiency of transmission of malaria.

There is no program specifically developed to address the impact of climate change. However the present programs contain activities that address health problems that are increasing due to climate change. Climate change causes frequent rainfall and flooding. This has resulted in the destruction of root crops and vegetables creating problems of lack of or shortage of proper food and increase in malnutrition and other non-communicable diseases.

The Ministry of Health and Medical Services (MHMS) does not have any response strategy addressing climate change issues as yet. Thus the impact of climate change and variability on health is not an issue of concern. However,

the MHMS intends to establish a country-wide programme on climate change and health under this programme which will include: advocacy; social mobilization; and community and behavioral change. The programme will facilitate climate change and health awareness-raising dissemination of results of research and training, increase the supply of bed-nets in affected areas, relocate health facilities from disaster-prone areas (e.g. from low to high ground), increase the supply of vitamins to populations affected by floods and storm surge, improve surveillance and monitoring of climate-related diseases and improve emergency services and improve climate change capacity-building and training to health professionals.

Outcome 1: Improved understanding of the relationship between diseases and climate change and variability.

Outputs:

- 1.1 Manual/guidelines on incidence of malaria and climate change and variability developed and used.
- 1.2 Community-based health and climate change awareness programme developed and implemented.
- 1.3 Targeted groups (women and youth) trained on health impacts, disease prevention, contamination of water supply prevention and managing sanitation during and after climate-related disasters.
- 1.4 Solomon Islands Medical Training Institute strengthened to conduct education, awareness-raising and information dissemination on impacts of climate change on human health.

Outcome 2: Strengthened capacity and capability of MHMS to address impacts of climate change on human health

Outputs:

- 2.1 Disease outbreaks predicted and efficiently managed.
- 2.2 Disease prevalence reduced
- 2.3 Climate change impacts on health mainstreamed into health planning
- 2.4 Information and data for early warning developed and implemented

Budget

It expected that a total of USD 6,500,000 will be sought from the least developed countries fund (LDCF) through the GEF. Co-financing of this project will be sourced from the other development partners, national government and other bilateral agencies working in the health sector in the Solomon Islands.

SOLOMON ISLANDS

NAPA PRIORITY PROJECT NO. 3 WASTE MANAGEMENT

Goal

Main goal of this project is to better manage impacts of climate change on waste management

Rationale

Droughts resulting from climate change, unlike floods have had little appreciable impact on waste management. Whilst effects of flooding including climate induced events are significant to waste management. With slack management practices as is current throughout much of the country; events of heavy rainfall can result in drastic negative waste repositioning impacts, such as waste from upstream can reach newer downstream locations that may subsequently contribute to causing coastal pollution.

Climate change induced fires including bush fires is a living threat particularly with prolonged drought periods. And the aftermath of such events can be drastically wasteful and can contribute to accumulation of large quantities of waste of disaster proportions.

As an island nation impacts of sea level rise including storm surges is an ever present threat. Concerns with storm surges extend beyond causing waste management issues, to property damage and even threats to peoples lives. In coastal towns and environments with uncoordinated waste disposal practices, storm surges would contribute directly to redepositing of coastal waste to coastal strips which are public access areas.

Tropical cyclones are increasingly becoming a common occurrence and its destructive effects contribute a great deal to accumulation of debris and waste. Minimum standards in disaster response, particularly for the relief phase of disasters normally address urgent needs of waste management. The follow on rehabilitation for waste management is the responsibility of the Government. Provisions under the currently developed waste management regulations would provide for national coordination with other relevant departments and organizations.

Whilst dealing effects of climate change is not an easy task. Appropriate education and awareness is the alternate and practical option to pursue. Naturally, time and patience are basic necessities required from the outset to convince minds and hearts of people to make easy the task of education. Any

such awareness programme must call for expert input to tailor made a well designed waste management educational programme that can be easily communicated for ease of digestion by the majority of Solomon Islanders. That too would necessitate serious consideration of dissemination tactics and methodologies that have been proven to work in our local environment.

Objective: To develop a national integrated sustainable Waste Management Plan and Strategy for incorporating impacts of climate change.

Outcome 1: To develop a database on impacts of climate change on waste management.

Outputs:

- 1.1 Data and information on impacts of climate change on waste management developed and used.
- 1.2 Climate-friendly and appropriate technologies for waste management identified and used.
- 1.3 Guidelines for waste management in climate-sensitive and highly vulnerable areas developed and implemented
- 1.4 Promote awareness and information exchange on waste management and impacts of climate change

Outcome 2: Encourage incorporation of impacts of climate on waste management into educational curricula.

Outputs:

- 2.1 Curriculum on impacts of climate on waste management is developed and implemented
- 2.2 Understanding of impacts of climate change on waste management is enhanced.
- 2.3 Climate change issues are incorporated into waste management regulations.
- 2.4 Infrastructure for waste disposal systems climate-proofed.

Implementation - See Chapter VII

Sustainability of the programme

Waste management is currently implemented under various legislations and by-laws. The absence of an institutional framework for managing waste means that waste is managed on a piece-meal basis. The growth of towns has

increased the production of waste. Some issue of concern for sustainability include very old and rundown liquid waste networks, land tenure issues preventing new areas being developed for waste disposal and expansion of sewer networks. Unplanned urban development is also putting pressure on old sewer networks and the reliance on septic tanks particularly in exposed areas are prone to adverse impacts of climate change and sea level rise.

Budget

The cost of this project is estimated at USD 500,000 which will be sought from the LDCF and other multilateral and bilateral development partners. Co-financing of this project will be sourced from government's recurrent expenditure, bilateral aid donors and others.

SUDAN

NAPA PRIORITY PROJECT 1

ENHANCING RESILIENCE TO INCREASING RAINFALL VARIABILITY THROUGH RANGELAND REHABILITATION AND WATER HARVESTING IN THE BUTANA AREA OF GEDARIF STATE

RATIONALE

Pastoral systems are a major contributor to the Sudan economy. In 2005 the animal wealth was responsible for 19.3% of national GDP (Ministry of Finance and National Economy, 2005). Over 80% of rural households in Sudan earn their livelihoods from a combination of pastoral and agricultural activities. However, Sudan has experienced increasing levels of rainfall variability in recent decades, which has led to diminished water availability and fodder production as current practices have been slow to adapt to changing rainfall patterns. Ensuring that fodder production systems remain viable in the face of increasing rainfall variability is of critical importance throughout Sudan.

As part of a past pilot project, a small dam was constructed in 1997 in the *Wabi Abu Garod* valley to capture and store rainfall run-off during the rainy season and make it available to meet irrigation and other needs. The successful experience of the dam thus far has been recognized by local communities as a significant contributor to building resilience against rainfall variability. Water harvesting techniques that are suitable relative to expected increased evapotranspiration from climate change would help reduce the vulnerability of communities in *Batana* area.

Baseline Situation

The proposed project will reduce vulnerability to increasing rainfall variability through rangeland rehabilitation in the *Butana* area of *Gedarif* State in northeastern Sudan. This site, home to over 30,000 people spread out in 10 major villages, has been chosen because it is traditionally known as the most important communal grazing area for all tribes in the region (as well as for a number of tribes from neighboring states), particularly during the rainy season. In the past, *Butana's* rangelands have been characterized as one of the best in northeastern Sudan by virtue of their abundance of high value fodder species and the relative absence of most pests and diseases that threaten animal health.

Climate Variability and Climate Change Problem

A consensus clearly has emerged among pastoralists in the region that climate has been changing over the past few decades and has adversely affected the productivity of *Butana's* rangelands. Rainfall became unreliable and erratic leading to more frequent low-level drought episodes, while widespread anecdotal evidence affirms that temperature levels have also been increasing. This combination has resulted in the steady deterioration of both the productivity and biological diversity of the *Butana* rangelands. In addition, given its past reputation throughout northeastern Sudan as a highly productive rangeland area, it has attracted relatively distant pastoralists struggling to cope with their own local drought conditions in other parts of Sudan. This combination of circumstances has intensified pressure on its fragile and deteriorating resource base, further exacerbating the vulnerability of its pastoralists.

DESCRIPTION

Goals and Objectives

The proposed project will also seek to reduce local vulnerability to increasing rainfall variability through the introduction of widespread and suitable water harvesting techniques in the *Butana* area. This area is known as a natural water catchment zone in which rainfall runoff during rainy seasons typically drains into a number of valleys. However, water is then discharged downstream without being tapped as optimally as possible for agricultural, household, and livestock watering activities.

The main goal of the proposed project is to enhance the resilience of local communities in the *Butana* area to current and future rainfall variability through rangeland rehabilitation and the widespread introduction of water harvesting and storage techniques. Within this broad goal, there are several major objectives as follows:

- To rehabilitate Butana communal rangelands through the introduction of new fodder rotation and management schemes;
- To improve household income diversity through the introduction of new cottage industries in order to provide alternative income sources during periods of low rainfall;
- To identify optimal water harvesting, storage and spreading techniques relative to climate change and to implement these techniques to the fullest extent possible in the region;
- To reduce pressure on rangelands resources through building awareness among pastoralists and other livelihoods regarding community forestry and alternative firewood resources;
- To mitigate the potential for future conflicts over dwindling rangeland resources from rainfall variability by providing basic services for nomads and herders, including safe access and regress routes to minimize conflict between nomads and farmers in the area.

Project Activities

The main activities will include:

- Mapping of the vulnerable fodder production areas in the region and identifying suitable sites for water harvesting technologies;
- Organizing local people and establishing leadership committees (e.g. friends of the environment and/or development committees) to assume an active role in the implementation of project components;
- Evaluating the potential of various water harvesting and utilization techniques relative to local climatic conditions;
- Designing and constructing water harvesting systems (from stone, sand, and other local materials as necessary) to harvest rainfall run-off;
- Developing a drought early warning system through the installation of rain measurement and other meteorological measurement equipment and technologies;
- Training pastoralists and building awareness among local communities for the storage and utilization of water and communal fodder management schemes.

Relation to current policies

The current 25-year development strategy aims to conserve water resources for domestic and other users in this area through afforestation to reduce land degradation

and desertification. Also, the proposed project is consistent with rural development policies and objectives.

Expected near-term outcomes

The main outcomes expected from the proposed project include:

- Development of a database of *Butana* rangeland characteristics;
- Greater flexibility in responding to drought through the early warning system as well as improvement in household income levels/diversity;
- Improvement of water supply in the area for meeting different needs of local people;
- Development of local awareness of environmental challenges and tools/skills to meet those challenges.

Project Duration

The duration of the proposed project is 3 years.

COST

The overall cost of implementing the various activities of the project is:

Estimated at USD 2,800,000

A breakdown of major project costs is outlined below.

Budget for Enhancing resilience to increasing rainfall variability through rangeland rehabilitation and water harvesting in *Gedarif* State

Activity	Year 1 (USD)	Year 2 (USD)	Year 3 (USD)	Total (USD)
Mapping	200 000	100 000	50 000	350 000
Fodder production schemes	50 000	200 000	250 000	500 000
Set up of cottage industries	50 000	100 000	150 000	300 000
Equipment	250 000	400 000	100 000	750 000
Evaluation of water harvesting	50 000	50 000	0	100 000
Construction	50 000	225 000	150 000	425 000
Training	50 000	50 000	50 000	150 000
Management	75 000	75 000	75 000	225 000
Total	775 000	1 200 000	825 000	2 800 000

SUDAN

NAPA PRIORITY PROJECT 2

REDUCING THE VULNERABILITY OF COMMUNITIES IN DROUGHT-PRONE AREAS OF SOUTHERN DARFUR STATE THROUGH IMPROVED WATER HARVESTING PRACTICES

RATIONALE

Southern Darfur State is located in western Sudan and is inhabited by 3.8 million people (according to the 1993 census). Agriculture, which represents the basic livelihood in the State, has always been practiced in a very traditional way under diverse conditions of climate and soil. People grow staple as well as cash crops. However, they face the threat of crop reduction and crop failure due to the variability and continuous decrease in rainfall that has been recorded in the region since 1921. The rainfall isohyets are found to be moving southward.

In the last century, Southern Darfur State was exposed to drought cycles during the years 1987, 1989, 1990, 1993, and 1996. Residents are still suffering from the negative impacts of these cycles, which have affected the entire Darfur environment. The combined effect of rainfall variability/reduction and drought has culminated in reduced surface water runoff. The rate of recharge of groundwater basins has also been significantly reduced. Dams, *hafirs* and reservoirs, which depend on surface water, were/are not receiving enough water relative to their storage capacity. Rangelands are also experiencing rapid deterioration, and the effect is reflected in the total pasture production, which is only enough to meet 53% of animal population's needs in the State. Consequently, this has led to early grazing and overgrazing of the rangelands.

Furthermore, due to drought some herders are being forced to move southwards (Tesy Tesy fly zone) where chronic conditions exist for the spread of disease. Certain tribes have lost their herds and have been forced to uproot their livelihoods - some have become subsistence farmers; others have migrated and become internally displaced persons (IDP). The scarcity of resources has led to social tension among the different tribes and in the whole region of Darfur, culminating in serious and violent conflict.

Baseline Situation

The NAPA consultation process showed that the whole state is quite adversely affected by climatic variability. However, the most vulnerable groups are those who live in Shairiah, Muhagriah, Malam, Darbat, Marshung. The communities of these vulnerable areas have suffered from the reduction of both agricultural and animal production, which was caused mainly by the variability/reduction of rainfall and scarcity of water resources. The vegetation cover of these areas has been seriously deteriorated due to the dependency of the local people on it for the supply of their basic needs (e.g. fuel wood, building materials).

Climate Variability and Climate Change Problem

With further variability/reduction in rainfall and with more frequent droughts, the situation will worsen in Darfur. The loss of production is likely to be acute and desertification is expected to cover wide areas. The poverty level will be higher, which might mean loss of lives and even more severe conflict over scarce resources.

DESCRIPTION

Goals and Objectives:

The main goal of the proposed project is to enhance the resilience of local communities in the drought-prone areas through water harvesting measures. Within this broad goal, there are several major objectives, which are as follows:

- Secure water supply in dry areas, which will increase productivity of arable and grazing land;
- Increase yields of rain fed farming so as to minimize the risk of crop failure in drought prone area;
- Supply drinking water for animals;
- Supply domestic water for people;
- Tribal conflict avoidance.

Project Activities

The main activities will include the following:

- Use of water-harvesting techniques in order to increase feeding rate of ground water and to reduce soil erosion;
- Increase of production through the increase of cultivated areas;
- Rehabilitation of Gum Arabic belt through re-cultivation of Hashab trees (*Acacia Senegal*);
- Combat desertification by afforestation, fruit tree planting and agro forestry;
- Promotion of social forestry;
- Rehabilitation of rangeland and provision of satisfactory veterinary services;
- Poverty reduction.

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 the 25-year National Strategy and the Poverty Reduction Strategy Program (PRSP). It has also strong links with the Millennium Development Goals (MDGs).

Expected Near-term Outcomes

The main outcomes expected from the proposed project include the following:

- Increased productivity of both animals and crops;
- Increased farmers' income;
- Increased vegetation cover;
- Wise increase of livestock number;
- Increase of the level of environmental awareness;
- Poverty reduction;
- Improve quality of life;
- Release tension over resources and ensure stability in the project area.

Project Duration

The duration of the proposed project is 3 years.

COST

The overall cost of implementing the various activities of the project is:

Estimated at USD 2,500,000

A breakdown of major project costs is outlined below.

Budget for reducing the vulnerability of communities in drought-prone areas of southern Darfur State through improved water harvesting practices

Activity	Year 1 (USD)	Year 2 (USD)	Year 3 (USD)	Total (USD)
Construction of water harvesting scheme	250 000	400 000	100 000	750 000
Recultivation of Hashab trees (small farmers)	50 000	100 000	112 500	262 500
Social forestry	50 000	100 000	137 500	287 500
Rehabilitation of rangeland	100 000	225 000	135 000	460 000
Provision of veterinary services	50 000	50 000	50 000	150 000
Fruit tree planting and agro forestry	50 000	100 000	125 000	275 000
Training	45 000	45 000	45 000	135 000
Management	60 000	60 000	60 000	180 000
Total	655 000	1 080 000	765 000	2 500 000

SUDAN

NAPA PRIORITY PROJECT 5

STRATEGIES TO ADAPT TO DROUGHT-INDUCED WATER SHORTAGES IN HIGHLY VULNERABLE AREAS IN CENTRAL EQUATORIAL STATE

RATIONALE

Central Equatorial state is located in Southern Sudan, geographically located between latitude 6°N and 3.95 °N and longitude 27 °East and 29 °East. The total area of the state is about 46,300 square kilometers, with total arable land of about 31,200 square kilometers. Current population is 1,375,684 people (based on December 2006 records FAO – Juba office).

Soils are sandy clay with alluvial soil. The state is inhabited by groups of native tribes mainly Bari, Mundari, Lokoya, Lububo, Nyamgwara, Pojulu, Kakuwa, Lugware, Kaliko and Monakupi. The nomadic tribe in the state is Mvndari; their main livelihood is raising cattle, sheep and goats, with little agricultural activity practiced. The majority of the tribes in state are agro-pastoralists. They practice agriculture as a source of livelihood and also maintain small herds of cattle, sheep and goats for marriages, prestige and traditional practices.

Baseline Situation

Juba County has a permanent water source, the River Nile. In addition, there are other sources of water such as seasonal rainfall, seasonal water streams and scattered water ponds fed by rainwater. Despite the richness of Juba county regarding water supply, all these sources are associated with several obstacles and constraints. The utilization of all these water sources is not efficient due to lack of infrastructure and the fact that the people lack the technical know-how to utilize and harvest water sources.

The participatory vulnerability assessment and the NAPA consultation process revealed that the county has two seasons i.e. wet and dry seasons. But due to climate change in the area, agricultural activities (crops and livestock) are increasingly water stressed due to prolonged dry seasons and shortened rainy seasons with substantial fluctuations in the quantity and distribution of water.

The recently ended armed conflict in the Southern Sudan damaged the basic infrastructure in the state, including land and livestock. This coincided with changes in rainfall patterns, rendering local communities more vulnerable to the impacts of climate variability and change.

Therefore, there is a great need to adapt to these circumstances in order to mitigate and reduce the effect of water deficiency in dry seasons. Such action will give people greater hope for poverty alleviation among them by increasing household incomes from agriculture and livestock practices.

Climate Variability and Climate Change Problem

The state is classified as rich savanna with an average rainfall of 900-1,000 mm per year. The topography of the state is undulated with many streams ending in the Nile, the main water source in the state. Rainfall patterns typically commence in March and end in October. With climate change, rainfall is commencing in April/May and ending in September/October with low intensity, which leads to water shortages in the region.

DESCRIPTION

Goals and Objectives:

The main goal of the proposed project is to promote sustainable livelihoods in the Southern Equatorial State. Specifically, this involves the establishment of two micro-catchments with the capacity for holding 10,000 – 15,000 cubic liters of water. Within these broad goals, the major objectives are as follows:

- Address the problem of water shortage due to drought in areas highly vulnerable (e.g. in the areas of Liggi, Tigore and Kuda);
- Introduce agroforestry practices to increase the adaptive capacity to climate changes in west Juba areas;
- Reduce the vulnerability of local communities to increased malaria transmission from climate variability;
- Minimize the negative impact of floods in highly vulnerable areas (e.g. Jebel Lado, Mongalla and Gondokro);
- Reduce the vulnerability of rangelands to climate change in the areas of Terekeka and Tali.

Project Activities

The main activities will include the following:

- Physically survey the land in order to locate the side of micro-catchments, dams and bore wells;
- Arrange for the bidding of contractors;
- Enlargement of the water reservoirs behind the dams and water catchments;
- Use of filters and pipes for improvement of water supply to the villages and residential areas;
- Introduction of tariffs for cattle and other livestock watering;
- Introduction of irrigation systems for pasture improvement and grazing management;
- Develop extension training programmes for proper water management as well as plants and livestock husbandry;
- Introduction of fish species for additional nutrition of high protein and income generation;
- Raise awareness regarding water resources management;
- Improve capacity of local communities regarding water resource management and safety.

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 water conservation strategies in the Central Equatorial State.

Expected near-term outcomes

The main outcomes expected from the proposed project include the following:

- Cease seasonal migration of the people searching for water and pastures;
- Reduce water borne diseases;
- Increase productivity and income generation of household and individuals by reducing the distances of fetching water, as well as reducing diseases;
- Increase potential and improve grazing management in the area;

- Introduction of new natural resources such as fish and fruit trees;
- Increase income generation and its diversity;
- Increase crop and milk production and its sustainability.

Project Duration

The duration of the proposed project is 3 years.

COST

The overall cost of implementing the various activities of the project is

Estimated at USD 5,000,000

A breakdown of major project costs is outlined below.

Budget for Strategies to adapt to drought-induced water shortages in highly vulnerable areas in Central Equatorial State

Activity	Year 1 (USD)	Year 2 (USD)	Year 3 (USD)	Total (USD)
Land surveys	100 000	135 000	75 000	310 000
Enlargement of water reservoirs	125 000	225 000	265 000	615 000
Improvement of water supply	275 000	335 000	375 000	985 000
Introduction of tariffs for cattle/livestock watering	35 000	55 000	75 000	165 000
Irrigation systems for pasture improvement/grazing management	425 000	495 000	480 000	1 400 000
Introduction of fish species for additional nutrition	300 000	350 000	200 000	850 000
Training/extension programmes/awareness raising	125 000	125 000	125 000	375 000
Management	100 000	100 000	100 000	300 000
Total	1 485 000	1 820 000	1 695 000	5 000 000

UGANDA

NAPA PRIORITY PROJECT NO. 8 INDIGENOUS KNOWLEDGE (IK) AND NATURAL RESOURCES MANAGEMENT PROJECT

JUSTIFICATION

Communities have from time immemorial used indigenous knowledge to cope with climate variability and extreme weather and climate events. During the NAPA process many IKs were encountered and they tended to be area, culture- and subject specific. For example, in Rakai, the Lwanyi, a local shrub is used as antidote to lightning. In Karamoja, initiation of farming following the first rains is sanctioned by the elders after examining the content of ruminant guts and forecasting based on an apparently “indigenous meteorological system”. Others include food preservation in Kapchorwa using honey, rain making using a combination of rituals and herbal concoctions, and water purification using Moringa seeds. These traditional practices are of considerable cultural value to communities, although the scientific basis of some of them is doubtful.

IK is integral to many community based practices in the areas of agriculture, forestry, water, wildlife, human and animal health management. These time-honored practices (IK) are effective ways of involving communities in sustainable management of natural resources. IK thus provides a suitable entry point for community mobilization and action.

To exploit this potential for adaptation to climate change, there is need to document and understand IK and where possible establish their scientific basis. Despite the need, modern research efforts have largely ignored the integration of IK. This is due to lack of frameworks for conducting research in this important area, coupled with total disregard of IK due to misconception and disrespect of cultural values.

DESCRIPTION

Objectives

The major objective is to enhance sustainable use and management of natural resources by the vulnerable communities. Specific objectives include:

- Support the maintenance, protection and continuity of use of indigenous knowledge in the management of natural resources;
- Create awareness among stakeholders about the importance of use of indigenous knowledge in natural resource management;
- Develop and implement strategies based on use of indigenous knowledge that would enhance communities to cope with effects of climate change.

Activities

- Document and validate climate related indigenous knowledge (IK) for natural resource management;
- Develop and implement community based strategies for effective NR management;
- Train communities in integrated NR management;
- Promote use of appropriate IK in natural resources management;
- Strengthen collaborative management of NRs;

- Identify and promote alternative livelihoods.

Inputs

The following inputs are envisaged: human resource of various professions, supplies, vehicles, logistical support, community mobilization and copyright services.

Short-term outputs

- Booklets on IK for natural resource management available and distributed to communities;
- Enhanced use of IK in NR management by communities;
- Incentive-based enforcement of NR management at community level;
- Trained community-based technicians in NR management;

Long-term outputs

- Enhanced sustainable use and management of natural resources by the communities;
- Better understanding and appreciation of cultural values;
- Enhanced adaptive capacity of communities;

Risks and barriers

- Inadequate funds;
- Civil conflicts;
- Poor information access and flow;
- Insufficient community mobilization;
- Undervaluing IK by elites;
- Poor packaging of IK;
- Competition by western knowledge;
- Lack of recognition and copyright protection by relevant authorities;

IMPLEMENTATION

The Ministry of Water, Lands and Environment (Department of Meteorology) will be the official recipient and will delegate to the appropriate institutions to implement the project in close collaboration with key stakeholders such as local governments and civil society

Monitoring and evaluation

This important stage of project implementation will be a joint activity, involving the target communities and financiers. To facilitate the process a logical frame for the project will be constructed in which milestones of achievements and their objectively verifiable indicators will be clearly specified.

Time Frame

A period of 3-5 years is planned. Since there is an urgent need for adaptation to climate change, it should commence immediately.

FINANCIAL RESOURCES

NAPA implementation will require financial resources from the Government of Uganda, Bi-laterals, Multilaterals, NGOs and CBOs. Financial Requirements will include but not be limited to: costs of training of communities, construction works, technology development, facilitation of project component personnel, production of manuals, stationeries, computers and other office accessories.

Estimated total project cost is USD 1,200,000

UGANDA

NAPA PRIORITY PROJECT NO. 9 CLIMATE CHANGE AND DEVELOPMENT PLANNING PROJECT

JUSTIFICATION

The economic and social development of Uganda depends on exploitation of its natural resources, including climate. Climate is a key driver of the natural resources and therefore changes in Uganda's climate will directly and negatively impact on its social and economic development. The importance of climate and its relationship with natural resources and social economic development is not well understood nor are impacts of adverse effects of climate change on development well understood either by planners and policy makers. Therefore climate change issues are not taken into consideration in the development of sectoral and investment plans.

While climate change cannot be stopped, its impacts of adverse effects on social and economic development can be minimized by climate proofing development programmes. The cost of adaptation can therefore be significantly reduced and also spread.

The purpose of this project is therefore to support the development, dissemination and application of mainstreaming guidelines at various levels to climate-proof development activities. Generation of climate change scenarios and their packaging will be required to support dissemination of key messages to improve understanding of climate, its variability and change.

DESCRIPTION

Objectives

To integrate climate change issues into development planning and implementation at all levels.

Activities

The key activities are:

- Review existing relevant policies and laws/regulations in relation to climate change;
- Develop policy, laws, regulations and byelaws on climate change;
- Develop guidelines for mainstreaming including gender issues;
- Sensitize and train decision makers, planners and implementers on impacts of climate change;
- Undertake monitoring and evaluation.

Inputs

The inputs of this project include human resources, technical assistance and financial resources.

Short-term inputs

- Knowledge on gaps and weaknesses of existing legislation with regard to climate change available;
- Policy, laws, regulations, ordinances and byelaws on climate change available;
- Guidelines for mainstreaming climate change at all levels available;

- Pool of trained climate change agents across sectors;
- Development plans integrating climate change.

Potential long-term outputs

The long-term output of this project is climate change proofed development programmes.

Risks and barriers

- Inadequate funds;
- Poor information access and flow;
- Inadequate sector awareness.

IMPLEMENTATION

The Ministry of Water, Lands and Environment (Department of Meteorology) will be the official recipient and will delegate to the appropriate institutions to implement the project in close collaboration with key stakeholders such as local governments and civil society

Monitoring and evaluation

This important stage of project implementation will be a joint activity, involving the target communities and financiers. To facilitate the process a logical frame for the project will be constructed in which milestones of achievements and their objectively verifiable indicators will be clearly specified.

Time Frame

A period of 3-5 years is planned. Since there is an urgent need for adaptation to climate change, it should commence immediately.

FINANCIAL RESOURCES

NAPA implementation will require financial resources from the Government of Uganda, Bi-laterals, Multilaterals, NGOs and CBOs. Financial Requirements will include but not be limited to: costs of stakeholders' sensitization, facilitation of project component personnel, consultancy costs, production of manuals, stationeries, computers and other office accessories.

<p><i>Estimated total project cost is USD 1,200,000</i></p>

ZAMBIA

NAPA PRIORITY PROJECT 3

APPENDIX II: NAPA OPTION 1

ADAPTATION TO THE EFFECTS OF DROUGHT IN THE CONTEXT OF CLIMATE CHANGE IN AGRO-ECOLOGICAL REGION I OF ZAMBIA

RATIONALE/JUSTIFICATION

Assessments that were undertaken as part of the NAPA process indicate that climate change will increase vulnerability especially in arid regions, which typically correspond to Agro-Ecological Regions (AER) I and II in Zambia. The NAPA has highlighted that areas suitable for staple crops, such as maize production in these regions are likely to reduce by more than 80%. Within these regions, since the 1980s, there has also been a tendency for the later onset and earlier withdraw of rains, as well as an increased occurrence of drought years. At the national level, yield changes and other impacts under climate change scenarios suggest frequent shortages of grain. Vulnerability assessments on the economic costs of climate change on agriculture in Zambia undertaken by the World Bank, with support from FAO and the University of Pretoria, indicate that these regions will exhibit severe deficits at critical periods of the cropping calendars. Such deficits could result in severe yield decrease for specific crops such as maize. Based on a CO₂ doubling scenario in these regions, some estimates predict a yield reduction of approximately 66% under rain-fed conditions but only about 16% under irrigated conditions. Currently, less than 5% of arable land in Zambia is irrigated. With changes in rainfall patterns, the average length of the growing season length for maize is also likely to become shorter, with models predicting an approximate reduction in the length of the season of 20%. From an agro-climatic perspective, maize (the main national staple) is already somewhat marginal in AER I, as annual rainfall is commonly insufficient for the crops sown. While agricultural systems are already quite close to the limits of their coping ranges, simulations of future climate change in AEZ I show that maize yields are likely to fall even further under both rain-fed and irrigated conditions.

The proposed intervention “Adaptation of the agriculture sector to climate-induced water deficits in Zambia” will complement current agricultural policies and development support programmes. This NAPA follow-up project will contribute towards integrating climate-induced risk management of water resources within the agricultural sector. It will contribute towards improving adaptive capacities of key stakeholders (policy makers, and local communities) to overcome key water availability challenges under worsening climatic conditions.

DESCRIPTION

Overall Objective

To reduce the vulnerability of those depending on rainfed agriculture practices to anticipated rainfall shortages in the face of climate change including variability.

Activities

1. Pilot irrigation and water management systems introduced;
2. Training communities on how to maintain and manage irrigation systems in the context of climate change, including variability;
3. Capacity building of farmers on water management practices;
4. Provide extension support and marketing (supported with co-financing);

5. Provision of credit (supported with co-financing) for irrigation schemes.

Inputs

- Technical expertise throughout the lifecycle of the project;
- Office equipment, computers, and accessories;
- Vehicles;
- Irrigation equipment/system;
- Human (including consultants), and financial resources;
- Other small equipment.

Short-Term Outputs

- Efficient integrated climate forecasting information system;
- Capacity building, education and public awareness.

Potential Long-Term Outputs/Outcomes

Measures to reduce impact of climate change, including variability (e.g. drought/flood) on food supply introduced (e.g. irrigation, and risk spreading institutions). Improved communication and utilization of climate information ranging from seasonal forecasts to longer-term projections

IMPLEMENTATION

Institutional Arrangement

MACO is expected to be the lead agency to be involved in the proposed initiative and will be the executing agency. Other relevant stakeholders include MTENR, MEWD, ECZ, Water Development Board, Local government institutions at provincial and district level, NGOs, Research institutions, Cooperating partners in conjunction with ZAWA and CBO will have to again play a major role in ensuring that communities are encouraged to participate, Multilateral institutions, Current water users, in particular emergent and traditional farming households.

Risks and Barriers

Eroded soils in many regions, lack of capacity for improved agricultural techniques, and challenging baseline climatic conditions, the potential inadequate capacity on the part of the GRZ to implement (at least part of) the National Irrigation Plan in region I as part of a strong and committed development policy, and the inadequate financial capacity and political will on the part of the GRZ to invest in the rural sector in the target area for project continuation and replication.

Evaluation and Monitoring

The implementers will monitor the project with the participation of other stakeholders. The MTENR will assume the responsibility of evaluating the project to ensure that it conforms to terms and delivery of results on a regular basis.

COST

<i>USD 3,000,000</i>
