
NATIONAL ADAPTATION PROGRAMMES OF ACTION ON CLIMATE CHANGE



BANCO MUNDIAL



GEF



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NATIONAL ADAPTATION PROGRAMMES
OF ACTION ON CLIMATE CHANGE

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PREAMBLE

Democratic Republic of Sao Tome and Principe as a member of the international community and very well aware at the governmental level about the climate changes that the world is facing due to anthropic actions, the country signed in 1992, during the Rio Conference, a Convention framework of the United Nations Framework Convention about Climate Changes, that has been ratified in May 30 1998, becoming for instance a member of full right of the referred Convention.

Being aware of the fact that climate changes that will occur all over the world will have profound impact in different societies and, consequently, the impact on the life style and how to face the world, Santomean Government has decided to take this opportunity to present in the scope of the Convention with support of the World Bank, elaborate the present plan, that was financed by Global Environment Facility (GEF).

Considering that the first National communication has been elaborated and officially presented, this National Action Plan for Adaptation to Climate Changes (NAPA) has allowed to articulate the actions proposed in this communication with necessary and urgent measures so that the country would be able to adapt to adverse effect of the climate changes, according to other plans and programs already elaborated, in view to reduce poverty and reach the objectives of millennium.

Just by the fact that the document has been prepared with main objective to identify and promote the activities that respond to urgent and immediate needs of adaptation to adverse effects of the Climate Changes in rural communities and in most vulnerable zones of the country, this just reflects its connection with the objectives of millennium mentioned above.

The insufficient energetic situation that the country faces nowadays, as a result of the fossil combustible to electric production, the risks that fishermen is exposed to (the country relies on more than 70% of animal protein) due to an increase of extreme whether events related to the situation, it just indicated during the elaboration process how it has been important the elaboration of this present action plan.

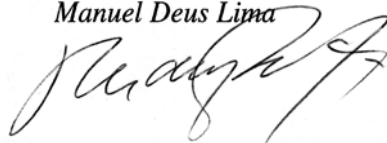
Due to the fact that this action is a transversal one, it had the merit to be as a result of a participative process in which society stakeholders were involved, namely, target groups of vulnerable communities, including different government institutions responsible for environmental management, civil society and NGO's with their individual contribution made this action plan become a reality.

While elaborating PANA, the country counted on with a precious collaboration of the World Bank, such as its implementation agency, National Environmental Technical Commission, in the follow up and evaluation of all the activities, as well as national and foreign consultants, to whom we address our thankfulness.

Once the decision 28/CP.7 is already fulfilled, in the scope to which specific and urgent actions of STP were identified concerning adaptation to adverse effects of Climate Changes, it is our pleasure to address to you the present document of the secretarial of UNFCCC, awaiting that, all together we can develop efforts in order to get financial support to implement the proposed actions.

The Minister of Natural Resources and Environment

Manuel Deus Lima



ABBREVIATIONS

AMC - Multi Criterion Analysis
AME - Acordos Multilaterais sobre o Ambiente (Multilateral Agreement on Environment)
BAD - Banco Africano de Desenvolvimento (African Developed Bank)
BISTP - Banco Internacional de São Tomé e Príncipe (International Bank of São Tomé and Príncipe)
BM - Banco Mundial (World Bank)
CDB - Convenção das Nações Unidas sobre a Biodiversidade (UN Convention on Biological Diversity)
CH4 - Metano (Methane)
CO2 - Dióxido de Carbono (Carbon Dioxide)
CO - Monóxido de Carbono (Carbon Monoxide)
UNFCCC - UN Framework Convention on Climate Change
DBS - Dobras (São Tomé and Príncipe currency)
DCP - Dispositivo de Captação de Pescado (Device for Fish Concentration)
DEFINITE - Software que faz an análise de decisão multicritério (Multi Criterion Analysis Software)
EMAE - Empresa de Água e Electricidade (National Water and Energy Company Supply)
ENAPORT - Empresa Nacional dos Portos (National Ports Company)
ENCO - Empresa Nacional de Combustíveis e Óleos (National Oil Company)
ENRP - Estratégia Nacional de Redução da Pobreza (National Strategy for Poverty Reduction)
FMI - Fundo Monetário Internacional (International Monetary Fund)
GEF - Fundo Global do Ambiente (Global Environment Facility)
HIVIEW - Software que faz a análise de decisão multicritério (Multi Criterion Decision Software)
MARAPA - Mar, Ambiente e Pesca Artesanal (Sea, Environment and Craft Fishing NGO)
NAPA - Programas Nacionais de Acção para a Adaptação às Mudanças Climáticas (National Adaptation Programmes of Action on Climate Changes)
NLTPS - Estudo Nacional de Perspectivas a Longo Prazo (National Study on Long Term Perspective)
N2O - Hemióxido de Azoto (Azote Hemi oxide)
NOx - Óxido de Azoto (Azote Oxide)
NM VOC - Compostos orgânicos voláteis não metânicos (Non Metallic Volatile Organic Compound)
OMD - Objectivos do Milénio para o Desenvolvimento (Millennium Development Objectives)
ONGs - Organizações não governamentais (NGOs)
PAE - Programa de Ajustamento Estrutural (Adjustment Structural Programme)
PIB - Produto Interno Bruto
PNADD - Programa Nacional do Ambiente para o Desenvolvimento Durável (National Program for Sustainable Development)
POPs - Poluentes Orgânicos Persistentes (Persistent Organic Polluent)
RGPH - Recenseamento Geral da População e Habitação (Housing and Population General Census)
STP - Sao Tome and Principe
UNCCD - Convenção das Nações Unidas sobre a Luta Contra a Desertificação (United Nations Convention Combat Desertification)
UNICEF - Fundo das Nações Unidas para a Infância
USD - Dólar Norte Americano
VOA - Voz da América (Voice of America)
ZEE - Zona Económica Exclusiva (Exclusive Economic Zone)
LDC - Least Developing Countries
CDM - Clean Development Mechanism
DFC - Device of Fish Concentration
GIS - Geographical Information System

First Part:

Presentation And Justification

I. SUMMARY

At its seventh session, the United Nations Framework Convention on Climate Change (UNFCCC) decided to help the Least Developed Countries (LDCs) in the design of their National Adaptation Programmes of Action (NAPAs). To this end, assistance was provided to the LDCs to enable them to identify their immediate needs and priorities for adaptation to climate change.

A deep analysis of our country was made, in respects of climate as well as the geographical, economical and financial situation. The studies, "Inventory of gases with greenhouse effect, GEE. 1999" and "National Strategy of Adaptation On Climate Change" allowed us to obtain information on the problem of emissions of gases with greenhouse effects and climate change in STP, as well as to delineate policies and measures to adopt in a framework for sustainable development.

According to the referenced studies, STP, emits 568.663,87 tonnes E-CO₂, but it absorbs 1.544.545,2 tonnes. The energy and transport sectors are the main emission sources. It is being caused mainly by a build-up of "greenhouse gases" that are released by human activities, in particular the burning of fossil fuels and firewood. However, the forest absorbs the totality emissions of E -CO₂. As a result, the forest plays a key role in our economy, by supplying firewood for making foods and wood for other needs, as well as in balancing our environment.

Increases in temperature and the decrease of rainfall are the country's greatest concerns, because these phenomena can have consequences on decreases in riverflow and the amount of the subterranean water. Economically, the negative impacts will be centered in energy production, in agriculture and livestock. Human health suffers the effects of climate change with the appearance of some diseases and aggravation of others.

In some regions of the country, floods, sea-level rise and coastal erosion have been reaching significant levels, putting major infrastructure at risk.

Community participation played a key role in the methodology and characterization of the main vulnerabilities used in the STP NAPA. The most vulnerable groups, such as small farmers, small fishermen, small merchants of agricultural products and women, suffer more directly the effects of climate change..

As a result, the studies show that the following situations contribute to vulnerability in STP:

- The global increase in temperature and emission of gases with greenhouse effect;
- The decrease in rainfall over the years, giving place to a decrease in riverflow and inadequacies in water supply;
- An increase in the length of the long dry season, "gravana1" , as happened in 2005 (April to September - 6 months), instead of the habitual 3 months (June to August), giving place to the drought;
- Occasional torrential rains with floods and land changes and destruction;
- Sea level rise, due to the glacier- and mountain snow-melt;
- Coastal erosion due to marine winds and inert extraction;
- Rivermouths are getting bigger due to floods caused by long torrential rains;
- Lightning strikes during violent thunderstorms.

Enquiries were accomplished in the south, centre and north of S.Tomé, as well as in Príncipe. The great participation of population, as a result of a sensitization campaign, allowed the identification of the phenomena of climate change in STP. For the whole country, the most critical phenomena are as follows:

- Decrease in riverflow,
- Decrease in rainfall,
- Increase in the length of the dry season,
- Increases in temperature,
- Rise of the sea level,
- Floods and consequent contamination of water,
- Coastal erosion,

Appropriate solutions were identified to minimize the effects of climate change, as well as the Selection Criteria, such as:

1. Avoiding loss of human lives;
2. Poverty reduction, because of the adaptation capacity and the priorities of the national politics regarding the poor population;
3. Synergies that can be found through multilateral or regional level;
4. Cost-effectiveness of interventions in given sectors;
5. Implementation risks;
6. Vulnerability reduction;
7. Sustainability.

As a result of the enquiries and documents analysis, 22 options were selected. Through Multi-Criteria

Table 1: List of priority projects

Rank	Projects	Costs, millions USD	Sector
1	Training and equipment for artisanal fishermen	0,35	Fisheries
2	Establishing a system of climate alert	0,5	Infrastructure
3	Communication action for behavior change	0,1525	Health
4	Placement and installation of Device for Fish Concentration (DFC) in coastal zones	0,25	Fisheries
5	Construction of two systems of drinking water supply in rural zones	1	Water
6	Reinforcement and diversification of agricultural production	1,65	Agriculture
7	Integrated project of livestock development (goats and cows) in the north part of S. Tomé	0,9	Livestock/Agric
8	Sustainable management of forestall resources	2,915	Agriculture
9	Relocation of local communities (Malanza, Sta Catarina and Sundy) at risk of floods and landfalls	0,5	Infrastructure
10	Construction of shelters and parks for fishing artisanal	0,3	Fisheries
11	Introduction of the new technologies for firewood use and to make charcharcoal	0,5	Energy
12	Establishing the agro- tourist complexes at Monte Café and Porto Real	0,6	Infrastructure
13	Create an epidemic data base about potentials diseases related to CC	0,02125	Health
14	Elaboration of strategic and emergency plans emphasizing the health sector	0,03625	Health
15	Reinforcement of Human Technical Capacity of National Civil Protection and Fire Brigade	0,2	Civil Protection
16	Training (doctors, nurses, volunteers, helpers students, etc..) for emergency needs and study visits	0,215	Health
17	Sustainable management of water and energy	0,3	Water/Energy
18	Correlate data for diseases of vector origin, focussing on malaria, through GIS systems ,with MARA/OMS initiative foreseeing the spatial risk of the problem (epidemic malaria)	0,2	Health
19	Introduction of renewable energy	0,5	Energy
20	Construction of two hydro power-stations, at Claudino Faro and Bernardo Faro	0,5	Energy
21	Evaluation and planning the hydro resources	0,4	Water/Energy
22	Reinforcement the car parking of the National Civil Protection and Fire Brigade	0,35	Civil Protection

Analysis (MCA), options were defined by priority order. Those options were presented in project records, according to the NAPA recommendations.

The final document, the national NAPA, should be submitted to the Minister of the Natural Resources and Environment (MRNMA). The Government must approve the NAPA as an official document and has a responsibility to implement its conclusions and recommendations.

The implementation strategy should be settled established by the National Institute of Meteorology, who elaborated NAPA. The implementation process should be executed with transparency by talking about the stages accomplished or in course with the local community and the participants involved in the process.

The NAPA allows the National Institute of Meteorology, as the implementation agency:

- To synthesize all the existent information about vulnerabilities as a result of climate change, as well as sea level rise and deforestation;
- To communicate and work with all about the more urgent change needs and priority;
- To communicate with development partners that STP is vulnerable and needs assistance urgently to protect the populations from the adverse impacts of climate change.

After documentation was analyzed the following recommendations were made:

- The adaptation of measures for STP has as its objective the improvement of life for the most vulnerable population groups of the country, seeking to minimize the disastrous effects of climate change; consequently reducing the poverty;
- The final document, the national NAPA, should be submitted to the Minister of the Natural Resources and Environment. The Government must approve NAPA as an official document;
- The Government should take the responsibility to implement the conclusions and recommendations contained in NAPA;
- The implementation of NAPA should be executed by the National Institute of Meteorology (INM) of the MRNMA in a transparent way. Regularly, accomplished stages or those in course should be communicated to communities and all stakeholders involved in the process;
- The National Institute of Meteorology should play the role of the coordination and implementation agency for NAPA;
- International consultation involving the partners of development of the country should be involved in order to find ways and opportunities for financing.

INTRODUCTION

At its seventh session, the United Nations Framework Convention on Climate Change (UNFCCC) decided to help the Least Developed Countries (LDCs) in the design of their National Adaptation Programmes of Action (NAPAs). To this end, assistance was provided to the LDCs to enable them to identify their immediate needs and priorities for adaptation to climate change. With the support of Global Environment Fund (GEF), documents were elaborated and contain data about the country emission levels that contribute to a healthier planet earth and for the sustainable and harmonious development of S. Tomé and Príncipe...

The documents are as follows:

- The Greenhouse Gases Inventory, elaborated in 2001, with 1998 as a base line;
- The Studies of Vulnerability and Adaptation to the Climate Change, 2002;
- The First National Communication on the Climate Change, 2004;
- The National Strategy for Adaptation of Climate Change, 2004.
- The National Report and Strategy for Drought and Desertification.

As well as these documents, at the level of the environmental sector the following are referred to:

- The National Plan of Environment and Sustainable Development (PNADD), 1997;
- Report on Persistent Organic Pollutants (POP), 2003;
- The National Profile of Chemical Substances, 2005.
- The National Strategy for Bio-diversity

With the presentation of the 1st National Communication at the 11th Conference of the Parties in December 2005, S. Tomé and Príncipe had a document that enables it to be at the position to the world scale, according to the Protocol of Kyoto, and within the International Community puts it in the category of countries with no pollutants, in other words, that have sink capacity to drain CO₂ but are particularly vulnerable while being least able to afford the cost of adaptation to climate change.

The United Nations decided to pay attention to a group of countries considered as the Least Developed Countries (LDCs), in terms of economic and social development. Climate change affects all countries but developing countries are particularly vulnerable while being least able to afford the cost of adaptation to it.

Decision no. 5 of the 7th Conference foresees that those countries should have a specific program to help them deal with the phenomenon of climate change because they can not afford the cost of adaptation and prevent the overcome adversities.

To accede to the advantages put to the disposition from the International Community, in the quality of LDCs (paragraph 8 and 9 of the art. 4.º, of process of the United Nations Framework Convention on Climatic Change); S. Tomé and Príncipe should elaborate a National Adaptation Plan of Action (NAPA), in agreement with the Decision 28/CP.7, that establishes the outline to follow during the elaboration process.

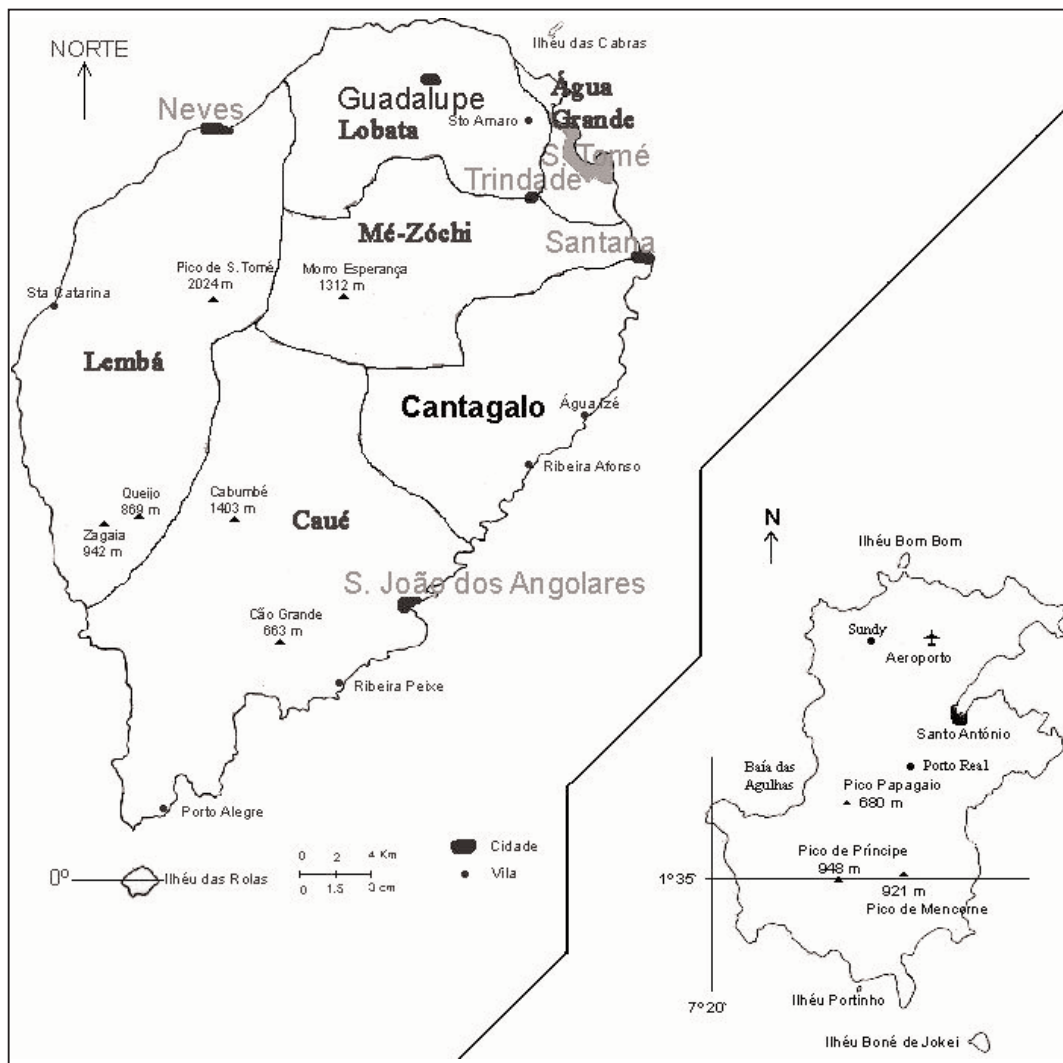
Country Characterization

The Democratic Republic of São Tomé and Príncipe is an archipelago constituted by two main islands and four islets, located in the Gulf of Guinea, between the latitudes of 0° 01'Sul and 1° 43 ' North and longitudes of 6° 28 ' and 7° 28 ' East.

The islands of S. Tomé Príncipe are respectively about 360 and 269 km off the Western coast of Africa continent. Príncipe is located 160 km to north of S. Tomé.

The area of the country is 1.001 km², being 859 km² for São Tomé island and 142 km² for the island of Príncipe. The population is approximately 137.599 inhabitants (R.G.P.H.) in 2001. The population is essentially young, 79% with less than 35 years and is predominantly urban.

Map 1: STP Map



These islands present a humid tropical climate, with abundant rains almost the whole year, with the exception of the months of June to August, corresponding to the period of the "gravana", where a decrease of the precipitation and temperature are verified, with winds blowing from the south-south-west quadrant. Due to the characteristics of the relief, many micro-climates prevail, being observed above all in the highest parts, areas with high rainfall.

The country has considerable resources of superficial water, distributed in an irregular pattern in the whole territory, but with a predominance in the southern area that is the least inhabited.

The temperatures are equally influenced by the relief, even though it has been recognized that important variations in the increase from the highest areas to the lowest ones. As an example :(average of the day) Lagoa Amélia (1488 m):18, 4° C; Monte Café (690 m):22, 4°C; Airport (8m):26, 2°C.

The humidity is also very high, and can reach at Lagoa Amélia an average of 92% during almost the whole year, and being less high in the areas of lower altitude, varying between 70 and 80% along the year.

Surface sea temperature averages 27°C. Salinity averages a concentration of 35 parts per 1000, of which 27 are of sodium chloride and the remainder constituted of magnesium, calcium and potassium. As a result, our sea has a basic characteristic (PH = 8).

Climate Change in S. Tomé and Príncipe

Regarding the analysis about the situation of climatic change, the conclusion was reached that the summary of the emissions for S. Tomé and Príncipe, expressed in equivalent of carbon dioxide (E-CO₂), the absorption capacity is in the order of the 975.881 tons E-CO₂. The sectors of the residue and industrial processes, agriculture and livestock are not emitting CO₂.

The sectors of energy and forests are responsible for the totality of CO₂ emissions, with a total of 507.876,63 tons. Only 36.519,00 tons of those emissions, that is, 7%, represent the emissions of CO₂ originating from the conversion of forests to savannah. The forests absorb, in return, 1.582.287, 00 tons of CO₂. Other gases emitted by the country are: CH₄ (3.498, 43 tons), N₂O (40, 05 tons), NO_x (1.022, 73 tons), CO (21.085, 08 tons and NMVOC (344, 54 tons). The energy sector is responsible for 43% of the emissions of CH₄, 70% of N₂O, 81% of NO_x and 83% of CO.

The forest sector has a sink capacity of 1.544.546, 70 E-CO₂.

In spite of possessing this capacity for carbon absorption of, due to their large area of forest, to be included in the dynamics of the clean development mechanism in agreement with the concept of Clean Development Mechanism (CDM), under the Kyoto Protocol, São Tomé and Príncipe should use the following actions to reach the axes of reduction of global climate alteration:

- To search for no pollutant industrial options, in agreement with the CDM;
- To develop and implement new technologies for the use of renewable energy (wind, solar, biogas, hydropower, among other.);
- To fight against burning;
- To reforest.

Characterization of Main Vulnerabilities

STP is a small and very vulnerable country to the effects of climate change, due to the fragility of its ecosystem and low level of social-economic development. In any of the sectors in analysis, the enquiries accomplished by the consultants confirm the results of the studies previously mentioned. The following phenomena are indicated:

- Increase in temperature throughout the whole country, in the last years;
- Decrease in rainfall and the consequent decrease of the riverflows in the East;
- Lengthened dry seasons;
- Landfalls due to torrential rains, particularly on mountain slopes;
- Destruction of the forests due to high firewood consumption and intensive agriculture in areas of great slope;
- Loss of materials and fishing equipment;
- Loss of human lives by disappearance at sea;
- Partial or complete destruction of the embarkations in the harbors or on the beaches;
- Destruction of houses where the families of the fishermen live as a result of sea level rise;
- Increase of women's poverty, because of the loss of their husbands' fishing materials, equipment or the lives at sea. As a result, they must take care of the home administration with scarce resources;
- Increasing numbers of illiterate children because they give up school to fish and to reinforce the sustenance of the family;
- Parking of embarkations near to public roads, at risk of accidents and the destruction of the embarkation by vehicles;
- In some areas, after long drought, when the first rains fall, landfalls occur resulting in destruction with significant losses of material and goods (Sundy) and, in other cases, floods (Santo António city, Malanza and Santa Catarina, among other);
- In coastal communities, the populations have been experienced sea level rise, and an increase of coastal erosion (Praia Pesqueiras and Praia Diogo Nunes). Increasingly, the increase of floods leave the surrounded population isolated in their own houses (Santa Catarina, Malanza and Ribeira Afonso);
- It was detected that, due to the lack of protection, barriers, dikes and containment walls, coastal erosion has been reaching significant levels, above all, causing large movements to the coast line (Diogo Nunes), leaving unprotected populations (Praia S. Pedro in the Príncipe and

Malanza) or causing the decrease of the tourist activity (Praia Pomba).

We considered the vulnerability and the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate changes, including climate variability and extremes. In our analysis, when we approached the linked phenomenon to pluvial-fluvial floods, coastal floods and landfalls, we considered that it is clearly high relatively for STP the risk level to vulnerability.

Table 2 -Estimate degree of vulnerability/risk of the CC phenomena in STP

Phenomena	Floods	Coastal floods	Storms	Landfalls	Drought
Risk level	A	A	A	M	M

Legend: risk level: low=B; Medium=M; high=A

Source: Analysis based on the verifications done in the enquiry to the populations, GDE and bibliographical consults.

In the health domain it was verified, by interviews with people and health technicians, that the country is exposed to some health problems and epidemics caused by climatic change, such as:

1. Significant increase of waterborne diseases, through the contamination of water supply provoked by the floods and bad sanitation conditions. Diseases such as: cholera, typhoid fever, shistosomiasis, etc;
2. The Roll-back Malaria Programme in course can combat this disease. However, pluvial-fluvial floods, as well as coastal floods, could provoke a real catastrophe causing malaria epidemics, with significant human losses;
3. Respiratory diseases, such as pneumonia, asthma, bronchitis, etc;
4. Ocular diseases (epidemic conjunctivitis) that usually increase at drought time, becoming sometimes epidemics;
5. Landfalls: besides the economic damage with indirect health effects, it can provoke poly-traumatism that cannot be treated inside the country. In addition, the basic sanitation conditions can worsen;
6. Finally, the more common effects of CC, such as the increase of the temperature, for instance, can modify the environment and allow the reintroduction/installation of eradicated pathologies, as is the case of the trypanosomes, because of increase of people's circulation and goods between the continent and STP.

In the agriculture-livestock and forest sectors, the causes of the vulnerability can be marked as follows:

1. Absence of good handling practices and zoo-technical and agriculture-forest management;
2. Absence of races of animals and plants that adapt to the extreme drought and/or desertification;
3. Lack of environmental education.

Proposed adaptation measures to lessen the effects of the climate change in agreement with the agriculture-ecological areas were suggested to those consulted. Those measured were the integrated development of the agriculture, livestock and forests, that guarantee the sustainability of the productive system, capable to guarantee the alimentary safety of the populations and to generate income for the farmers, sylviculturists and livestock owners, and also, protecting the environment.

In the fisherie sector, fishermen, as well as their respective families, are very vulnerable to climate change, because of the specific characteristics of their work. In spite of a long tradition, fishing continues to be practiced by artisanal fishermen using the same techniques that were used more than 50 years ago. The canoes continue to be produced from the trunks of trees and with sizes that vary between 4-12 meters in length and 0, 80 to 2 meters of width.

On the other hand, the fishermen are forced to move to areas more and more distant in search of fish for sustenance. Frequently, they disappear at sea or suffer great material losses (motors, nets, lines and canoes), as a consequence of the strong winds, fog, turbulence at sea, etc.

FRAMEWORK OF THE ADAPTATION PROGRAMME

1. Vision, Mission and Objectives of NAPA

NAPA only seeks to find adaptation needs of climate change and not to solve the global problems of development of the country, that are the government's responsibility, through its own policies.

With the Program of Priority Actions (PPA) 2006-2008, presented in Brussels, during the Round Table of December of 2005, Objectives and the Strategy of Development were established, as well as the Plan of Action that the Government should implement. The Strategy that is centered on the Good Governance and Poverty Reduction to assure the economic accelerated growth during next three years pronounces around four priority axes, namely:

1. Reforms of public institutions, reinforcement of their capacities and promotion of a policy of good government;
2. Accelerated growth and redistribution;
3. Creation of opportunities and diversification of incomes for the poor;
4. Development of the human resources and improvement of access to basic social services.

To those four axes were associated a last one that it corresponds to the monitoring and evaluation of the actions to develop. The Strategy of Poverty Reduction doesn't sympathize with punctual initiatives, for that if it turns necessary the viability of a mechanism to monitor of actions and systematic evaluation and consequent adaptation and actualization.

Therefore, in spite of the width, and multi-sectoral character of poverty phenomena, accentuated by the small size of the country and the economic difficulties, the need of establishment of a separate unit was recognized. The unit should be technically autonomous and capable of monitoring and evaluating the strategy, and coordinating the execution of the strategy at the level of the several implicated sectors and assembling a system of permanent and periodic evaluation of the poverty situation in S. Tomé and Príncipe. What is compared perfectly that should also be create for the NAPA.

Considering the main determinants of the poverty and based on national studies of long term perspectives, ENRP seeks a significant reduction of poverty by 2015, through the good use of human potential and the material resources of the country, as well as through bilateral and multilateral cooperation. The strategy includes its own fundamental axes and the following global, medium and long term objectives:

- To reduce by half the percentage of the Santomense population that lives in poverty (53,8%) by 2010 and less than 1/3 by 2015;
- By 2015 increase the access of whole population to the basic social services and to promote the improvement of quality of life of the population;
- To reduce the social differences and genre among the various districts and between these and the Autonomous Region of Príncipe;

On the other hand, compatibility with the Government's Millennium Development Goals(MDG) was examined in order that actions at the level of the different strategic axes were in agreement.

With their external partners' support and in the light of several conventions already ratified by the country, it is intended that PPA helps to assure macroeconomic stability; best practice for good governance; a competitive and active private sector; an efficient public sector; quality of education and health services; solids cultural values and a sustainable management and environment.

The NAPA vision is to reach a high level of adaptation capacity by the communities, in the face of the negative impacts of Climate Change.

As other insular countries, São Tomé and Príncipe faces several challenges in the search for sustainable development: small territorial extension, isolation, susceptibility to natural disasters and limited capacity and means to achieve sustainability. However, the country recognizes that sustainable use and the conservation of its biodiversity are intimately related with its development.

The Government of São Tomé e Príncipe signed the Convention on Biodiversity (CBD), in June of 1992, it was ratified by the National Assembly in May of 1998. With the support of the "Enabling Activity Grant" of Global Environment Facility, the country concluded in 2004 its National Strategy and Action Plan about Biodiversity (ENPAB), having previously elaborated the National Biodiversity Report. The

conclusion of ENPAB endows the country with a strategy for conservation and sustainable use of their natural resources and biodiversity.

The ENPAB process of elaboration was conducted in participative and interactive way among several sectors of Santomense society, so, it can be compared perfectly to the NAPA.

The Mission consists of communicating in an urgent and immediate way the adaptation needs and the indispensable activities to face negative impacts of climate change, as well as to develop strategies to allow the reinforcement of capacities between the participants and the communities' agents.

It is in this context that global climate change has deep reflexes on the new form of existence facing the world. To this extent, the United Nations Framework Convention on Climate Change, (UNFCCC), is an instrument with measures to mitigate and to adapt to the new situations. São Tomé and Príncipe, as full member of the International Community, and concerned, at the highest level, with the climate transformations, adhered to Convention on May 30, 1998, becoming a member with full rights at Conference of UNFCCC.

São Tomé and Príncipe, an isolated archipelago in Golf of Guinea and open to a world in perpetual change, won't escape the economic, social and cultural transformations caused by the world climate change.

This international context constitutes a challenge to the country that forces deep economic restructuring and a use of the new technologies capable to guarantee adaptation to the era of climate change.

The main NAPA objectives are:

1. To develop and to implement projects based on activities destined to face the the variety of oeffects of climate change;
2. To protect the life and the people's well-being, as well as the infrastructure and environment;
3. To incorporate objectives and adaptation measures in the national polices and various sectors, as well as in the development objectives; and
4. To increase the knowledge on the impact of climate change and activities of adaptation in the communities, in the civil society and close to the Government.

Impediments to the execution of NAPA, remarks should be made on the weak capacity of planning, implementation and execution of the development objectives by the public administration. Effectively, an evaluation of the institutional environment shows four major weaknesses in Santomense public administration:

1. Lack of Political decision;
2. Lack of organizational capacity and management;
3. Lack of qualified humans resources and
4. Lack of material and financial resources.

So, to this extent, when training actions are planned to involve the public administration and civil society all the four weaknesses should be properly addressed.

VULNERABILITY EVALUATION AND NEEDS OF ADAPTATION

Adapted Solutions for Climate Change

In S.Tomé and Príncipe appropriate solutions for adaptation to climate change do exist. The country is rich in water resources and it possesses a dense tropical forest; however, those resources are being very badly managed, putting at risk the survival of the future generation and the country. Like this, in the face of verification and considering the effects of climate change, the following solutions were proposed:

Sectors of Agriculture and Forests

- Development of scientific and technical research about the introduction of new more productive agricultural varieties, with a wide spectrum of climate tolerance, allowing them to adapt to eventualities of climate evolution. This research effort equally should include the appropriate agrarian techniques to allow agricultural intensification, (crops, fertilization and structural enrichment of soils, forestry etc.);
- Creation of mechanisms for subsidy of agricultural and livestock exploration (agricultural funds for the compensation of losses from natural disasters);
- Installation of funds for alimentary and nutritious safety;
- Adapt the production systems to the local resources (or potentially) available;
- Increasing of income and improvement of the well-being of small producers in marginal areas (integrated approach that associates different species of animal and plants for obtaining different alimentary products for man and for animals, fertilizers and energy);
- Affecting financial resources (lodgings and feeding) and technical resources (medicines and vaccines) for the family (priority), commercial and institutional sectors;
- Reinforcing epidemic surveillance (active for diseases from list A and passive for diseases from list B) and prevention mechanisms, the control and eradication of the contagious and parasitic diseases;
- Conception of regulated norms regulate about livestock activity and publication of the Code Law of Livestock, already approved by the National Assembly;
- Definition, by law, of the exclusive areas for pastures and production of alimentary resources, to avoid the conversion of existent areas of pastures to urban areas and other uses.
- Development of integrated and sustainable animal feeding systems;
- Promotion of transformation activities and conservation (animal and human feeding) to deal with drought phenomenon and other adverse effects of the climate;
- Improving the zoo- technical and sanitary and environmental techniques (lodgings, effluents, natural fertilizer use);
- Improving the management of livestock production, in a way to guarantee the alimentary safety and saving as well as to avoid the deforestation and conflicts between pastoralists and farmers;
- Selection and genetic improvement as a measure to combat consanguinity and genetic aberration;
- Promotion of environmental education in the schools as well as technical advices of livestock and forest exploration to creators and farmers;
- Development of a systematic campaign of reforestation, to rehabilitate degraded forest spaces and construction of reservoirs of water and overhead irrigation;
- Development of a national program of reforestation and arboreal plantations and promotion of species producing good wood;
- Eradication of disordered trees felling and the production of charcharcoal in fragile ecosystems;
- Create community forests in areas under the management of the Directorate of Forests;
- Reinforcement of financial capacities, materials, techniques and human resources of the Directorate of Forests;
- Actualization, approval and application of the National Plan for Forest Development and elaboration of a Plan of Forest Exploration;

- Realize scientific research about the ecosystems and forest species;
- Establishment of an agriculture-ecological sampling defining the forests lands forests clearly;

Water and Energy Sectors

- Evaluation of water and forest resources in the country. Having good knowledge of those resources, efficient management according to our needs can be made;
- Introduction of monitoring policies of use of the referred resources, with introduction of appropriate tools (techniques and juridical), for the control rivers and forests;
- To contain the degradation of forests, introducing technologies that take the reduction of the consumption of firewood as energy, example: improved stoves;
- Accomplishment of technical studies and economic viability relative to the construction of wells, having in view the provisioning of drink water, as besides its volume and quality, its treatment is very onerous;
- Improvement of irrigation systems seeking the increment of agricultural production;
- Construction of systems of water supply for the population, using the sources and the rivers, whose treatment is much cheaper;
- Construction of hydropower stations, by more accessible technologies and national knowledge;
- Introduction of other types of renewable energy in the country, besides water, such as biomass, solar, wind, etc, reducing the consumption of fossil fuel. A deepened evaluation of energy resources should be effected;
- Construction of artificial lakes, barrages and dams, with the objective of storing rain and river water;
- Construction of reservoirs of drinking water, creating a strategic reserve, capable of supplying the population, in cases of natural catastrophes.

Infrastructure, Public Works and Tourism Sectors

- Placement of barriers;
- Relocations of some communities or parts of them;
- Construction of dikes, bridges, schools, drainage ditches and roads;
- lightning rod placement;
- Rehabilitation of beaches and hotel Infrastructure;
- Plantation of coconut trees and bamboos;
- Construction of water reservoirs;
- Marine sand extraction;
- Establishment of agriculture-tourist complex;
- Implementation of a climate and sea condition system alert;
- Reinforcement of the capacity for data collection.

Public Safety and Civil Protection Sector

Public Safety policies and Civil Protection have as its base, on the one hand, the duty of all to assure solemnity-protection and contribute to the safety of community to which one belongs and on the other in the duty of Central Government, Regional Governments, and district councils as well as other institutions, associations and companies, each one at its level, assuming, without reservations, the responsibilities in which they are competent in several areas inherent to public safety activities and civil protection

For that, it is important to create favorable, efficient and coordinated conditions for the operations of assistance and attendance, it being indispensable that the Government has a National Plan of Emergency and an Operational Centre of Emergency and Civil Protection and Fire-Brigade

The adaptation measures regarding climate change are the following:

1. Measures to establish normal order and organization;
2. Measures of exceptional order in emergency situations;

3. Measures before the varied phases of an occurrence.

Measures of Normal Order and Organization

- To guarantee the operational maintenance of Civilian Protection agents' readiness, doing simulation exercises as a form of testing the response capacity and of reaction and promoting the evaluation of results;
- To develop training actions and citizen information, reflecting the seriousness of protection and collaboration with the authorities;
- To endow the country, if possible, with technical, technological and human resources, for the operational sustainability demanded in situations of that type;

Measures of Exceptional Order in Situations of Emergency

Without reference to legal determinations of states of siege and of emergency, in the case of occurrence or danger of occurrence of serious accident, catastrophe or calamity, the following measures can be established as exceptional, destined to restore the normality of life conditions in the reached areas:

- To limit circulation or people's permanence or vehicles of any nature, in hours and certain places or to limit them to certain requirements;
- To temporarily request movable or immobile goods, as well as services;
- To occupy facilities and places of any nature, with exception of the ones that are destined to habitation;
- To limit or to ration the use of public services, transport, communications, water supply and ● To determine the civil mobilization of individuals, for certain periods of time, in territorial areas or for sectors of activity, putting them at the dependence of competent authorities;
- Affecting special financial resources destined to support the entities directly involved in the installment of assistance and attendance to those effected.

Measures for the varied phases of an occurrence

Before the occurrence:

- To prepare a National Centre of Emergency Operations for Civil Protection, endowed with the necessary means and sufficient resources for its operation;
- To prepare an alternative National Centre of Emergency Operations for Civil Protection, endowed with available resources similar to the first.
- To execute an inventory of means, human resources and materials, to be involved in the combat and recovery of emergency situation.
- To inventory deficiencies in material and human resources, including technical deficiencies, proposing appropriate corrections.
- To study and to inventory risk factors and predictable vulnerabilities, proposing prevention measures to minimize the consequences of the occurrence of serious accident, catastrophe or calamity.
- To inform the population on the risks, the vulnerabilities and measures of protection to adopt.
- To foresee the use of medical services, for the elaboration the specific plans among several competing sectors.

During the occurrence:

To execute, through the Centre, operations of civil protection, to guarantee the execution of the following actions:

- To minimize the loss of life, if there are them, and goods as well as environmental damage;
- To guarantee the maintenance of law and order;
- To proceed to the displacement, temporary lodging and relocation of populations that the emergency situation imposes;
- To promote primary and secondary evacuation of the sick and the installation of the essential medical care for the effected populations;
- To guarantee the attendance and the well-being of the population and to promote the meeting of families;
- To proceed to sanitary actions, the repair and re-establishment of water and energy facilities;
- To assure the transportation of goods, water and fuels;
- To promote safeguards of historical and cultural patrimony;
- To obtain external help, to the extent of the existent bilateral agreements, whenever the exten-

sion of the damages is so serious that national resources are revealed insufficient;

- To proceed to the rehabilitation of the essential public services.

After the occurrence:

- To promote appropriate measures for the development of general plans of structural and infra-structural rehabilitation, in the human, social, economical and service and other areas, in a way to re-establish the conditions of normal life of the population in the affected areas;
- To organize actions of social reinsertion, in a permanent way, through specific intervention plans elaborated for the shelter group and its well-being, in articulation with other entities and organisms foreseen in the national plan of emergency.

Health Sector

- reation of a center of studies and observation of behavior and natural factors that can put in danger the public;
- Creation of trainings center for health personnel, police, etc. for rescue in emergency situation, as well as conditions for service and for attendance;
- Organization at the all levels of electronic data base, with information of generic personal identification and of medical status;
- To develop a specialized laboratory for epidemic studies and cases of emergencies.

Fisheries Sector

- Improvement of the construction of fishing embarkations;
- Delimitation of fishing areas with solar signaling buoys;
- Construction and installation of DFC in areas near to the coast;
- Preventive diffusion of meteorological forecasts;
- Installation of communication and rescue systems;
- Distribution of portable instruments of navigation and rescue (GPS, compasses and lifejackets);
- Construction of protections (wavebreaks, protector barriers and ditches) in the affected or vulnerable areas;
- Installation of bridges and/or flotation for embarkations;
- Creation of new spaces for parking canoes.

V. SELECTION AND PRIORITISATION OF OPTIONS

Establishment of Selection Criteria

According to NAPA, a group of classification criteria can be selected in the base of a diagnosis to the vulnerable sectors to the climatic changes. The sector evaluation allowed identifying measures with view to the adaptation to climate change and/or the reduction of their effects. In the identification of the criteria, the indicators for evaluation of the options should be focus. The NAPA seeks:

- The country priorities,
- The specific and urgent needs,
- The fight against the poverty and the women's valorization as part of the most vulnerable population,
- The costs of the interventions, etc.

According to the NAPA, selected criteria should be used to select adaptation activities. The defined criteria are the following ones:

1. Protection of human lives;
2. Poverty reduction in the country, according to the adaptation capacity and the priorities of national policies regarding the poor population;
3. The synergies that can be found through the multilateral and/or at the regional level agreements;
4. The cost-effectiveness of the interventions in the sector;
5. The implementation risks;
6. The reduction of the vulnerability;
7. The sustainability.

According to NAPA, relative to the santomense context, the presented criteria will allow that it proceeds to the analysis of current risks of climate change, and poverty reduction and allows sustainable development of the country, the technical management of the projects and the capacity of mobilizing financings.

Characterization of priority options

The adaptation measures for S.Tomé and Príncipe have as their objective the improvement of life of the most vulnerable populations of country, endowing the capacity to minimize the disastrous effects of climate change and poverty reduction. The measures are the following ones:

- Construction of dikes;
- Construction of reservoirs of drinking water;
- Rehabilitation of overhead irrigation;
- Rational exploitation of forest resources, eliminating the arbitrary felling of trees;
- Intensive plantation of trees;
- Reinforcement and diversification of the agricultural and animal production;
- Relocation of some communities in risk or part of them;
- Rehabilitation of beaches in risk and improvement of inert management;
- Construction of barriers and protections to sea edges;
- Construction and rehabilitation of roads and bridges;
- Creation of climate and sea condition alert systems;
- Creation and rehabilitation of tourist complexes in rural and other areas;
- Elaboration of an emergency medical plan, including training of health , volunteer and civil protection personnel;
- Reinforcement of the medical equipment in the country (hospitals, medical posts, equipment and consumable)
- Acquisition of a campaign hospital for emergency and other cases;
- Elaboration of databases;
- Reinforcement of technical and human capacity of different services of civil protection, such as the National Police and Fire-Brigade;

- Improvement of management of rural water resources;
- Utilization of renewable energy, reducing the use of fossil fuel;
- Training of the fishermen in the new technologies, so they are capable to overcome the unexpected climate;
- Introduction of protection equipment for fishermen (bridges, signaling, etc.) and
- Construction of conservation facilities for fish.

Those are the susceptible options to minimizing the effects of climatic alterations in S. Tomé and Príncipe.

Definition of activities and priority measures

The options of previous chapter were analyzed properly and budget was made according to the table below.

Quadro 3: Opções prioritárias

nn	Options	Cost in thousand USD	Sector
1	Relocation of population at risk of food and landfalls in Malanza, Sta Catarina e Sundy	500	Infrastructure
2	Beach rehabilitation and protection of tourist areas	570	Infrastructure
3	Construction of barriers, roads and bridges	350	Infrastructure
4	Establishment of a system of climate alert	500	Infrastructure
5	Construction of drainage ditches in Sta Catarina, Neves, Malanza, among others places	150	Infrastructure
6	Construction of dikes	560	Infrastructure
7	Rehabilitation of oceanographic	500	Infrastructure
8	Establishment of agro-tourist complexes at Monte Café e Porto Real	600	Infrastructure
9	Training and study visits (doctors, nurses, volunteers, students, etc..) for emergencies;	215	Health
10	Acquisition of materials and medical equipment	187,5	Health
11	Acquisition of a mini campaign hospital	1312,5	Health
12	Communication actions for behavior change	152,5	Health
13	Elaboration of data base of potential epidemic diseases related to climate change	21,25	Health
14	Rehabilitation and enlargement of sanitary network (4 buildings)	2750	Health
15	Data correlation about vector diseases, specially malaria, through GIS system with MARA/OMS, initiative that foresees the problem of spatial risk (epidemic malaria)	200	Health
16	Elaboration of emergency strategic plan focussing on health	36,25	Health
17	Sustainable management of forestall resources	2915	Agriculture
18	Integrated Project of development of goat and cow raising in the north part of São Tomé island	900	Agriculture
19	Reinforcement and diversification of agricultural productions	1650	Agriculture
20	Construction of two system of drinking water supply in rural areas	1000	Water
21	Evaluation and plan of hydro resources	400	Water/Energy

Quadro 3: continuação

nn	Options	Cost in thousand USD	Sector
22	Introduction of the new technology for use of firewood and making charcharcoal	500	Energy
23	Sustainable management of water and energy	300	Water/Energy
24	Construction of two hydro power stations at Claudino Faro and Bernardo Faro	500	Energy
25	Construction of a national water laboratory	1500	Water
26	Introduction of renewable energy (solar, wind and biomass)	200	Energy
27	Construction of shelters and parking for artesanal fleets	300	Fisheries
28	Construction and installation of Device for Fish Concentration (DFC) near to Coastal zone	250	Fisheries
29	Training and equipment for the artesanal fishermen	350	Fisheries
30	Strengthening of Human Technical Capacity: National Police	220	Civil Protection
31	Strengthening of Human Capacity: Civil National Protection Service and Fire-Brigade	200	Civil Protection
32	Reinforcement of car parking: National Police	250	Civil Protection
33	Reinforcement of car parking car: Civil National Protection Service and Fire-Brigade	350	Civil Protection

Em função dos critérios que foram definidos como indicadores, foi possível estabelecer a classificação das actividades por ordem de prioridade, através do Método Multicritério (AMC), conforme o quadro que se segue para os 22 projectos:

Table 4: List of priority projects

Rank	Projects	Costs, millions USD	Sector
1	Training and equipment for artisanal fishermen	0,35	Fisheries
2	Establishing a system of climate alert	0,5	Infrastructure
3	Communication action for behavior change	0,1525	Health
4	Construction and installation of Device for Fish Concentration (DFC) on costal zone	0,25	Fisheries
5	Construction of two drinking water supply systems in the rural zone	1	Water
6	Reinforcement and diversification of agricultural production	1,65	Agriculture
7	Integrated project of development (cow and sheep) in the north part of S. Tomé island	0,9	Livestock/Agric
8	Sustainable management of forestall resources	2,915	Agriculture
9	Relocation of local community (Malanza, Sta Catarina and Sundry) at risk of floods and landfalls	0,5	Infrastructure
10	Constructions of shelters and parks for artisanal artesanal	0,3	Fisheries
11	Introduction of the new technology for use firewood and to make charcoal	0,5	Energy
12	Establishing agricultural tourism at Monte Café e Porto Real	0,6	Infrastructure
13	Make an epidemic data base about potential diseases related to CC	0,02125	Health
14	Elaboration of strategic and emergency plans emphasizing the health sector	0,03625	Health
15	Reinforcement of Human Technical Capacity of National Civil Protection and Firework	0,2	Civil Protection
16	Training and study visits (doctors, nurses, volunteers, students, etc..) for emergency needs	0,215	Health
17	Sustainable management of water and energy	0,3	Water/Energy
18	Correlate data diseases of vector origin, focus on malaria, through system GIS with MARA/OMS initiative foreseeing the spatial risk of the problem (epidemic malaria)	0,2	Health
19	Introduction of renewable energy	0,5	Energy
20	Construction of two hydro power-stations, at Claudino Faro and Bernardo Faro	0,5	Energy
21	Evaluation and planning the water resources	0,4	Water/Energy
22	Strengthening the car parking of the National Civil Protection and Firework	0,35	Civil Protection

VI. NAPA PREPARATION PROCESS

Methodology

The present report was elaborated based on following methodology:

1. Establishment of two technical teams: one composed of (consultants) experts of the agriculture-livestock and forests, health, water and energy, Infrastructure and public works, fishing, public safety and civil protection sectors; and other that include enquiries personal of local communities, deep experts of their problems.
2. Compilation and synthesis of the available information on climate change and their effects: Programs of Action for sustainable Development and Poverty Reduction in STP, strategy and adaptation plans to vulnerability. The consulted documentation is listed in the bibliography.
3. Accomplishment of public consultation with participation of all stakeholders, fundamentally the local communities. In this way, women and men of the poor areas of the country were consulted, such as farmers, fishermen, inhabitants of the rural areas far away from the urban areas, as well as inhabitants of degraded neighborhoods. These were the target groups. On the other hand, the interviews had as a base questions and answers related to the effects of climate change in STP.
4. The method used for the accomplishment of public consultation, was the accomplishment of interviews, and discussions with the target groups. The information was collected equally from companies, managers, political and NGOs.
5. Based on the results obtained through those enquiries and consulted documentation, vulnerability factors, priority areas, vulnerable groups, and adaptation measures were identified according to country economic and social level.
6. Having identified and analyzed the activities, a list of project records were elaborated that will minimize the effects of climate change in STP.
7. The projects were selected through Multi-Criteria Analysis (MCA).

The participative evaluation should be understood as the process of appreciation of vulnerabilities that properly takes into account all interested parts (partners or participants), integrating them in the decision make about the projects.

AGRICULTURE, FOREST AND LIVESTOCK

The work focus was to identify the main vulnerabilities that are confronted, currently and in the future, in the sectors of Agriculture, Forests and Livestock with regard to to the climate change and to propose appropriate adaptation measures for the effect. For the accomplishment of this study the information used was obtained in the consultation of the bibliography and enquiries accomplished in 14 dispersed communities in different districts of the country. Older people, with many years of existence in these localities, were listened to through the method of participative diagnosis. The size of the groups varied from 12 to 33 elements.

In the concrete case of agriculture-livestock and forest sectors, we could verify that drought, floods (caused by the rains and waters of the sea), squalls and landfalls constituted the more preoccupying natural phenomenon. The impact of climate change in agriculture should be measured in losses of agricultural production and disappearance and/or appearance of crops. Due to the lack of quantitative data for the area, it is difficult to evaluate quantitatively the impact. Some facts that happened many years were brought to the memory of all:

- The destruction of Rebordelo2, in 1974, that buried the community's population;
- The drought of 1983, that provoked losses of agricultural production and the mortality of quite considerable crops;
- Strong rains during the growing season in 1984 and that damaged, in certain areas of country, the gramineous crops, as the corn;
- Squalls that occur in March/April and October/November and that are very harmful to certain agricultural production.

The indicated phenomena were selected because they are not common in these communities, and in recent times they have been becoming more frequent. In short, the most vulnerable areas for the agri-

culture-livestock and forest development were identified as being:

- North area and Centre where low rainfall exists - all the consulted communities in these areas point to the considerable decrease of the rains and a significant increase of months of drought. The agricultural production has been suffering continuous falls. An attention should be given to the case of storm lines, that, although occasional, cause important damages.
- South area (Porto Alegre and Malanza) - the decrease of the rains was also verified and agriculture is characterized by field crops (cereals) and some perennial crops during the rain season. It was also characterised by the spontaneous creation of pigs, goats and chickens without lodgings and marked by the absence of veterinary attendance and medication.

The technicians' opinions, articulated with the measures suggested by those consulted, show the need of unchaining a systematic campaign of reforestation, construction and recovery of the overhead irrigation, rehabilitation of degraded forest spaces, construction of reservoirs of water and dams in communities where the drought is already felt, as well as support for the construction of lodgings for animals.

INFRASTRUCTURE AND PUBLIC WORKS

Most of infrastructure and public works in S. Tomé and Príncipe date from colonial period. After the independence, the national authorities, entered into the everyday problems for which they did not find the most appropriate solutions until today, budgets were not used to develop actions for the construction of public works nor the implantation of infrastructure of public interest worthy of reference.

According to the vulnerability study and adaptation to the climate change in S. Tomé and Príncipe, the great majority of the country's economic infrastructure is placed in the coastal area and therefore is highly vulnerable.

As well, in the country's interior areas, torrential rains after long drought, have been provoking destruction of infrastructure and landfalls, putting at risk whole local populations of a place and impeding them to move and acquire sustenance. As an example, Iô Malanza's bridge on the road to Porto Alegre, broke in 2004 due to the action of strong rain, leaving the population of the South area isolated for several days.

As first stage for the identification of areas of larger vulnerability, an enquiry was elaborated that consisted of sensitization to the effects of climate change in the potential vulnerable places.

The objective of that sensitization was to obtain real data, including phenomena linked to climate change observed in the land. As a continuation of that action, two seminars were accomplished for collections of previous information, rendered by the representatives of local community. According to the information collected in the seminars and the previous sensitization campaign in S. Tomé and Príncipe, the following vulnerabilities were indicated:

In a general way in all districts and the Autonomous Region of Príncipe, it is characterized in terms of changes and climatic variations, by the following:

- The regularity of the rains was changed. According to the reports of the populations, the period of gravana was very long in 2005, giving place to drought, affecting excessively the agricultural production ($\pm 3/4$) as well as the water supply (about 50%).
- In some areas, after a drought period, the first long rains provoked landfalls, with significant losses of material.
- In the coastal communities, the populations have real references of sea level rising, with accentuated floods and gradual increase of coastal erosion.

Houses located on the shore, were formerly reason of their proprietors' pride, due to the cool temperatures and sea breezes, constitute today, in most of the cases, a danger for their residents, due to the threat of the phenomena of climate change and consequent coastal erosion, as well as from sea level rise.

ENERGY AND WATER

The country's geography shows zones located at rivermouths, on the slopes of mountains and in coastal areas, that are quite vulnerable. From visits and enquiries in different country areas, such as

Malanza, Santa Catarina, Ribeira Afonso, Praia Almoxarife, Pantufo, Micoló, City of Santo António, it was verified that these areas are quite exposed to the marine erosion. Table 5 reflects the main concerns of respective populations:

Quadro 5: Incidência dos problemas das Mudanças Climáticas no País

Items	Important Facts	Country Incidence
1	Decrease of riverflow	100%
2	Lack of water	80%
3	Decrease of riverflow in the dry season.	100%
4	Floods at the banks and rivermouths	70%
5	Decrease of rains	100%
6	Long dry seasons	100%
7	Sea level rise and consequent invasion of sea water	100%
8	Lack of drinking water (lack of treated)	65%
9	Floods(during rainy season)	50%
10	Quality of water	50%
11	Contamination of river water	100%
12	Several diseases caused by floods	50%
13	Decrease of agricultural productions	70%
14	Coastal erosion caused by sea level rise	100%
15	Landfalls due to strong rains	50%
16	Existence of overhead irrigation system	20%

The following information is the synthesis information collected during the visits and enquiries:

1. Decrease of rivers flows: The totality of those consulted (100%) in the whole country, in the south, centre, north areas, as well as in the autonomous region of Príncipe, warned of the decrease of riverflows;

2. Lack of drinking water: 100% of the consulted rural population says they do not have access to good quality of water, namely treated water. In the urban areas, 30% of those consulted don't have treated water.

3. Long Gravanoas: Gravana is a dry season with a duration of three months, but in the last years, according to the information of the population, it has a longer duration (about six to seven months). Príncipe island has seen the same phenomenon, as well as in the south area of S.Tomé island, at Porto Alegre and Ribeira Afonso.

4. Decrease of rainfall: Rains have been decreasing as well as riverflow. According to reports of the population floods were more frequent because of rains were more intense and of larger duration.

5. Sea level rise and consequent invasion of sea water: Communities on the shore, such as Malanza, Santa Catarina, Ribeira Afonso, Micoló, Pantufo, Praia Gamboa, verified this phenomenon has been more intense in the last years.

6. Contamination of river water: The population uses the river water for several needs and they have no alternative water supply when the floods happen. This is the case in Malanza, Santana, etc.

7. Lack of quality of drinking water, and lack of appropriate water treatment: The population uses the water of rivers, without any treatment.

8. Torrential rains and rising of river levels during rains: Some occurrence of torrential rains caused floods in some points of the country.

9. Several diseases caused by floods: 50% of the consulted population has knowledge of disease caused by contaminated drinking water, for that reason they request measures to reduce their spread.

10. Decrease of agricultural production: 100% of the consulted populations say that the lack of rains has been causing a decrease of agricultural production.

11. Coastal erosion caused by rising of sea level: In the consulted coastal areas, the alterations due to rising sea level can be observed easily, which was confirmed through the information of those consulted.

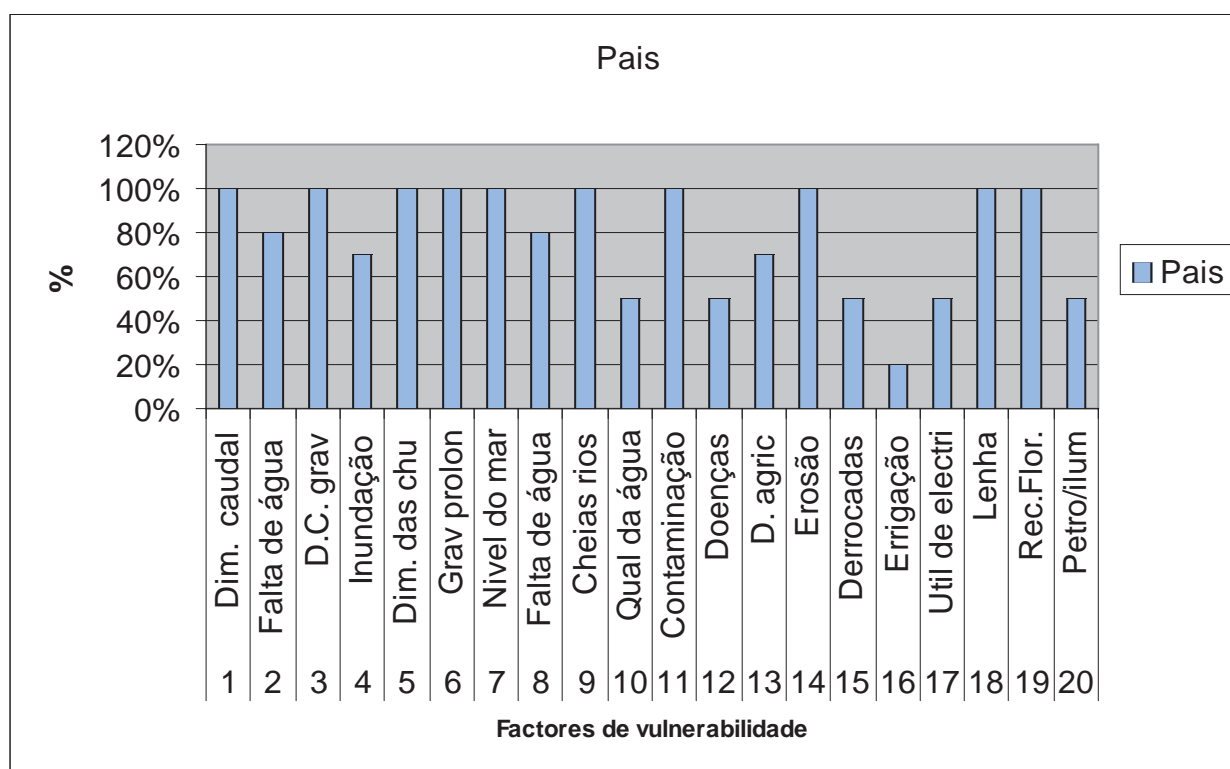
12. Destructions on hillsides owing to the strong rains: The destruction on the mountain slopes, usually after strong rains has occurred. In Sundry, forexample, where the destructions occur, great rifts still exist.

13. Existence of irrigation systems in the agricultural enterprise was noted, but the great part of them are out of service,

14. Weak electricity use: In the country, only the urban centers have electrical energy. In the rural world, about 80% of population does not. As a result, they use fossil fuel as an illumination and firewood for cooking.

15. High consumption of firewood Its true cost is ignored because they just go to the forest to collect the amount of firewood needed.

Gráfico 1: Levantamento das Vulnerabilidades



The graph above illustrates the incidence of the main vulnerabilities detected through the enquiry, in percentages, for the whole national territory. That result reflects the opinion of the universality of those consulted (100%):

- Decrease of riverflow;
- Decrease of rainfall;
- Long dry seasons;
- Sea level rise;
- River floods and consequent water supply contamination;
- Coastal erosion;

FISHERIES

The Fisheries sector is important for assuring the most significant contribution to the population needs in terms of animal protein. The dimension and the importance of fishing sector should be underlined

properly in the present study, for treatment as a quite vulnerable sector to climate change. The present report highlights the aspects that characterize the sector of fishing, the vulnerability of the sector and the effects as regards climate change, as well as on the proposals of measures for the adaptation and/or minimization of the effects and reduction of present vulnerabilities.

The information obtained from the consulted groups (of 3, 5, 10 and more fishermen) in the different districts. Gender was properly addressed, so more than 30% of the groups there were women. 27 groups were contacted at national level, and 92,6% of those consulted confirm that the squalls have been having devastating effect on fishing activity, while 37% of the same respondents indicated that flooding of rivers has been constituting a heavy burden for families. On the other hand, 51,8% of those consulted indicated fog as something completely unexpected and terrifying when they are in the sea. In addition, about 41% of those consulted considered that the invasion of the sea also caused material damage in the communities, while 51,8% of the fishermen reaffirm that the land, the boat moorings, and the beaches in general are being affected for the coastal erosion.

A great amount of sediment is brought down by the rivers during the rainy season and deposited in the coastal areas, which constitute the reproduction areas and fundamental growth zones of many demersal and some pelagic species.

The effects of these factors have the following consequences:

- Loss of materials and fishing equipment during the work of the artisanal fishermen;
- Loss of human lives at sea;
- Partial or complete destruction of embarkations in the harbors or on the beaches;
- Destruction of houses where the relatives of the fishermen live;
- Increase of the women's poverty, as a result of the loss at sea of materials, equipment or the lives of fishermen, causing them to assume all home management with scarce resources;
- Increase in the number of illiterate and/or working children (of school age) because they give up school for fishing to reinforce the sustenance of family;
- Embarkations near to the public roads;
- Displacement of whole families from beach to beach in very deplorable conditions.

HEALTH

There is a tendency for the increase of floods caused by rain and riverflows, storms and wind bursts and landfalls. Although the islands are quite vulnerable to coastal floods, it was not possible to gather historical data to confirm the tendency.

We considered the vulnerability as the "degree to which a system is susceptible or it is revealed unable to face the disastrous effects of CC ". When approached the phenomenon of floods as rainfall/river, coastal floods and landfalls, we can affirm that the vulnerability is clearly high for STP.

Table 6 -Estimate degree of vulnerability/risk of the CC phenomena in STP

Phenomenon	Floods	Coastal floods	Storms	Landfalls	Drought
Risk level	A	A	A	M	M

Legend: risk level: low=B; Medium=M; high=A

Source: Analysis based on the verification done in the enquiry to the populations, GDE and bibliographical consults.

It was verified, by interviews people and health technicians, that the country is exposed to some health problems and epidemics caused by climate change, such as:

(i) Appearance of epidemics diseases (cholera, typhoid fever, shistosomiasis and other DDA), that are spread through water contamination caused by floods and poor conditions of water supply and of sanitation;

(ii) Malaria, that with the interventions in course can be controlled, although the floods and rain/river floods along with the displacement that usually occurs can be catastrophic, provoking a malaria epidemic with high human losses;

(iii) Respiratory diseases, such as pneumonia, asthma and bronchitis;

(iv) Ocular diseases (conjunctivitis), that usually increase during drought, becoming at times epidemics;

(v) Landfalls, besides the economic damage, have indirect effects at health level, as they can provoke poly-traumatism that can not be treated inside the country. On the other hand, the basic sanitation can worsen;

(vi) Indirect effects are the poorer population with alimentary insecurity and the nutritional problems related such as mental deficiencies;

(vii) Finally, the more common effects of CC, such as the increase of the temperature, for instance, can modify the environment and allow the reintroduction/installation of eradicated pathologies, as is the case of the trypanosomes, because of increase of people's circulation and goods between the continent and STP.

Evaluation of Studies Relevant to the Climate Change

The analysis of the studies was undertaken:

1. Inventory of gases with greenhouse effect. GEE. DEZ/2002. RDSTP. MESA-Secretaria de Estado do Ambiente, Ordenamento do Território e Conservação da Natureza. Project. Mass Media Project;
2. First National Communication on Climatic Changes and National Strategy of Adaptation on Climatic Changes Secretaria de Estado do Ambiente, Ordenamento do Território e Conservação da Natureza. Dezembro 2004;
3. National Strategy and Action Plan about the Biodiversity. Secretaria de Estado do Ambiente, Ordenamento do Território e Conservação da Natureza;
4. National Strategy for Poverty Reduction, 2002.
5. Rapport National sur la desertification et degradation de sols, 2004

In the chapter where the analysis of vulnerability and adaptation need to climate change were made by sectors, such as, energy, water, agriculture, livestock, Fisheries, health, Infrastructure, etc, and the analysis of the situation of climate base, it is concluded that STP can suffer eventual climate disturbances. The studied hypotheses indicate a decrease of the precipitation considering a horizon of 50 years. The influence of those factors (temperature and precipitation), on the water resources, was reconfirmed in the different scenarios studied, indicating that STP can come to face a slow decrease of flow of its rivers and streams.

With regard to the cited studies, the flow of Iô Grande river would be reduced to an approximate value of 4.3 m³/s in the year 2050 (6.8 m³/s in 2020), which would mean a decrease in the order of 63%, considering medium value registered in the base situation (45% for the year 2020).

As well as socio-economic disadvantages to the country, other important negative consequences would be the increase of environmental contamination, as a direct effect of using thermal-diesel production, causing the production of more greenhouse gas effects, from gases such as CO₂, CH₄, N₂O, NO_x and CO.

As has been analyzed already, the values of flows, and consequently, energy production anticipated for the years 2020 and 2050 would suffer modifications due to the effects of climate variation. In this sense, a variation of project values was also considered with values in the range of + / - 15 and 20% for the years 2020 and 2050, respectively, in other words, that climate variation would cause a decrease or an increase of such values in the referred percentile orders. As for the potable water supply, irrigation, etc., the negative consequences could be enormous.

The decrease of precipitation over the years has also been provoking the decrease of water sources that constitute the source of water for the national systems of provisioning. The effect is caused by the weak natural capacity of replacement of underground water that should feed the source. In this way, such sources, already under pressure due to the constant increase in the search for drinking water, also face continuous breaks in the capacity of flow replacement.

As for irrigation, the decrease of rain will originate changes in irrigation habits at a national level, based almost exclusively on use of rainwater. The more intense search for riverwater as an alternative due to the lack of rains, will make the decrease of flow more visible and consequently reduce its hydro-ener-

gy potential.

The decrease in precipitation would also provoke relocation of population, due to the possible disappearance of some lines of water used by different communities today.

These guidelines were presented under the projects that we considered to be urgent to integrate into sectoral policies.

National and Regional Consultation

The elaboration of the NAPA based on a rating of the main vulnerabilities of the country, sensitive to the consequences of climate change, an analysis of situation, has tended to suggest appropriate adaptation measures to the context of the country and its resources.

For an evaluation of the vulnerability aspects of the country, we consider the consultation accomplished throughout the whole country, as is demonstrated in chapter IV, through interviews and enquiries of the populations living in very vulnerable areas. Soon afterwards, several bibliographical references related with the national development plans were consulted, plans of poverty reduction, as well as adaptation plans to the vulnerability. Consideration was also taken to the strategies and policies of implementation of the Environmental Conventions which include the Rio Conventions (Drought / Desertification, Climate Change and Biodiversity).

Implementation Strategy

The final NAPA document should be submitted to the Minister of Natural Resources and Environment (MRNA) to obtain the Government's approval, making it an official document. The Government must take the responsibility of implementing the conclusions and recommendations contained within the plan. The definition of the list of priority activities, translated in the form of a profile of the priority projects, shows the most urgent and immediate needs of the populations consulted throughout the country. As a result, the NAPA team, defined the appropriate measures according to the affected communities.

The Government should use the National Institute of Meteorology (INM) of MRNA to implement the NAPA in a transparent way and communicate regularly with involved communities and participants to inform them about on-going and accomplished processes.

The NAPA allows the INM, as implementation agency:

- to synthesize all the existing information on the vulnerabilities resulting from Climate Change, as well as sea level rise and the progress of deforestation;
- to communicate with and to work with all on the more urgent and priority adaptation needs;
- to communicate to the partners of development that STP is vulnerable and its urgent needs to protect the populations from the resulting negative impacts of Climate Change.

The main goal is to establish an implementation strategy that, after approval by the Government, allows:

- to initiate a process of international consultation involving the partners of development of the country, based on identifying projected profiles, allowing a wide discussion on the projects and opening the way for financing opportunities;
- to seek development partners' participation and financial help for the projects, with a base in the profiles previously defined, and that ensures that the implementation agency and coordination, INM, submits to the development partners involved detailed descriptions of the identified projects;
- to establish that the specific strategies of defined implementation in the profiles of each one of projects should serve as base to negotiate the financing and to establish the necessary partnerships, as well as for the execution of each one of the projects. The strategies should be established in detail in the project proposals. In addition, the implementation of projects should be led strongly in narrow collaboration and cooperation with the vulnerable communities. The level of project implementation is dependent on financial resources and the development partners' support, as well as the involvement and the regular feedback from the Government;
- to establish this, a Technical Committee should supervise all involved projects as well as a Monitoring Committee. This latter should be extended an observer mandate to the development

partners involved in the projects. The coordination agency (INM) should work in narrow collaboration with Monitoring Committee in all projects and both should be involved in monitoring the progress and the effectiveness of projects, during the implementation stage of each one of them. The evaluation of the vulnerability to Climate Change and appropriate strategies of adaptation adopted by the projects should be measured through identified indicators in each one of the profiles and proposals of presented projects.

It is hoped that this strategy will assure a reinforced capacity for adaptation on the part of the communities, of civil society and the Government, in way to answer, in an urgent and immediate way, the resulting negative impacts of the variability of Climate Change.

Second Part:

Priorities Activities Of Adaptation

VII - PROFILE OF PROJECTS OF PRIORITY ADAPTATION

The project records are in the Annex "Project Records".

● INFRA-ESTRUTURES AND PUBLIC WORKS

Relocation of local communities at risk of flood and landfalls in Malanza, Sta Catarina e Sundy
Establishment a system of Climate alert
Establishment of the agro-tourist complex in Monte Café e Porto Real

● AGRO-LIVESTOCK AND FOREST

Sustainable management of forestall resources
Integrated development Project of goat/cow -rearing in the north part of São Tomé
Reinforcement and diversification of agricultural productions

● HEALTH

Training and study visits (Doctors, Nurses, Volunteers, Helpers, Students, etc..) for emergencie
Communication actions for behavior change
Elaboration of epidemic data base for potential diseases related to CC
Correlation of data of vector diseases, specially malaria, through GIS system with MARA/OMS, initiative that anticipates the problem of spatial risk (epidemic malaria)
Elaboration of strategic and emergency plans emphasizing health sector

● WATER AND ENERGY

Construction of two systems for drinking water supply at rural area
Evaluation and planning of water resources
Introduction of the new technologies for firewood use and to making charcoal
Sustainable management of energy
Construction of two hydro-power stations in Claudino Faro and Bernardo Faro
Introduction of renewable energies (solar, wind and biomass)

● FISHERIES

Construction of shelters and parks for artesanal fleet
Construction and installation of Concentration Fish Device (DFC), at coastal zone
Training the artesanal fishermen

● PUBLIC SAFETY AND CIVIL PROTECTION

Reinforcement of Human technical Capacity- National Service of Civil Protection and Fire Brigade
Reinforcement of car parking-National Service of Civil Protection and Fire Brigade

VIII. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

STP, as a LDC, should be considered for support programs because it has no financial resources to face the phenomena of climate change or to take precautions to face the adversities that occur due to them.

The goal of the present NAPA is to establish a list of priority options of adaptation to climate change with a base in the local communities' expectations, in order to be submitted to financing from the international community.

In agreement with the results of the studies accomplished up to now, the phenomena that cause vulnerabilities in STP are:

- global increase of temperature, due to the emission of gases with greenhouse effect;
- the decrease of the rain over the years, giving place to the decrease of the riverflow and the inadequacy of water for the populations;
- very long dry periods. The prolongation of "gravana"(6 months in 2005, from April to September), instead of the habitual 3 months (June to August), giving rise to drought;
- occasional torrential rains, with floods and land destruction;
- sea level rise, due to the phenomena of glacier and mountain snow melt;
- coastal erosion, due to the action of marine winds and sand extraction;
- Increase of river mouths due to the floods and long torrential rains;
- Lightening strikes with thunderstorms that tend to be more and more intense.

The reduction of effects of climate change suffered by the population, shown in the form of poverty, malnutrition, several diseases, illiteracy, among others, was analyzed properly in this work.

The result of the study points that the climate change will cause a series of adverse problems to the country in the very near future.

The agriculture-livestock and forest sectors are characterized by the fragility of the agriculture-alimentary system, for aberrant erosion caused by the concomitant consanguinities and the sanitary risks as well as at the animal and crop level. The following are the main causes of vulnerability for this sector:

- the absence of good use practices and zoo-technical management and agro-forestall;
- the absence of races of animals and species of crops that adapt to the extreme drought;
- the desertification and lack of an environmental education.

The target groups consulted were constituted essentially of the farmers' families and cattle rearers. It should be pointed out that in this group also consists of fishermen who once in a while have to work in the fields.

The forest and water resources are very important, so there is a need for efficient management, in order to promote the development of the country. The distribution of drinking water for the population will have a quite important impact on the health of the whole population.

Budgets and actions were recommended for the sectors of health, fisheries, infrastructure, water and energy as well as civil protection and public safety that will minimize the disastrous effects of climate change in S. Tomé and Príncipe. These actions will have to form a framework in the country policies for development.

RECOMMENDATIONS

- The adaptation measures for STP have as their objective the improvement of life of the most vulnerable populations of country, seeking to minimize the disastrous effects of climate change and poverty reduction;
- NAPA should be submitted to the Minister of Natural Resources and Environment, to be approved by the Government, making it an official document;
- The Government should take the responsibility for implementing the conclusions and recommendations contained in it;
- INM, as the National Coordinator Agency of the NAPA, should proceed in its implementation in a transparent way and rendering regular information about accomplished or in-progress activities

to the communities and the stakeholders involved in the process;

- A process of international consultation should be initiated involving the partners of development of the country, in this way creating opportunities of financing the projects of priority action.

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ANNEXES

1. Matrix

Crossing among impacts, vulnerability factors, adaptation measures and projects

Table 1. Crossing among impacts, vulnerability factors, adaptation measures and proposed projects for public Works, Infrastructures and Tourism sectors

Verified impacts	Vulnerability factors	Adaptation measures	Proposed projects
Global increase of temperature The decrease of the rain over the years, giving place to the decrease of the riverflow and the inadequacy of water for the populations	Rains season alternate with drought- effects in agriculture and in the readiness of water for provisioning to the populations	Construction of water deposits Agro-tourist complexes at Monte Café and Porto Real	Construction of system of drinking water supply Establishment of agro-tourist complexes at Monte Café and Porto Real
Very long dry periods. The prolongation of "gravana"(6 months in 2005, from April to September), instead of the habitual 3 months (June to August), giving rise to drought	Alteration of regular rains with drought- effects in agriculture and inadequacy of water for the population		
Occasional torrential rains, with floods and land destruction, loss of beaches and fall of rays		Construction of ditches of drainage	Construction of ditches of drainage
		Construction of schools	Construction of schools
	Falls of rays	Red lightning placement in highest building	Placement of red lightning in highest building
Sea level rise	Sea floods in the coastal communities and isolation	Establishment of a system of climate alert	Establishment of a system of climate alert
		Construction of barriers Relocation of local communities	Construction of barriers Relocation of local communities
		Construction of dikes Rehabilitation of beaches and protection of tourist zone	Construction of dike Rehabilitation of beaches and protection of tourist zone
		Rehabilitation of oceanographic	Rehabilitation of oceanographic
Coastal erosion, due to the action of marine winds and sand extraction	Beaches, tourist zones and coastal roads disappear/ wet	Dragged of sands	Dragged of sand
		Construction of barriers, roads and bridges	Construction of barriers, roads and bridges
		Rehabilitation of beaches and protection of tourist zone	Rehabilitation of beaches and protection of tourist zone

Table 2 - Matrix of vulnerability factors result of country inventory (Agro-livestock and forest)

VULNERABILITY FACTORS	PRIORITY AREAS AND AFFECTED TARGET	IMPACTS	ADAPTATION MEASURED	MONITORIZATION INDICATORS AND EVALUATION OF OPTIONS
Drought	Porto Alegre, Malanza, Plancas I, Praia das Conchas, Mato Cana, Bernardo Faro Cadão, Abade, Belo Monte, Porto Real. Pequenos e médios Agricultores	Fall of animal and plants production. Vegetation degradation and reduction of the biodiversity (decrease of fauna and flowers resources)	To rehabilitate the overhead irrigations. Intensive plantations of trees (reforestation campaign) To rehabilitate the shadow of cocoa and coffee plantation. To build reservoirs of water for animals. To eliminate arbitrary trees cuts.	Amount of trees planted annually by unit of area. Number of water reservoirs of capacity built in each affected area. Reduction to 70% of arbitrary trees cuts.
Land destruction	Bernardo Faro, Santa Catarina. Pequenos e médios Agricultores e População residente.	In viability of the access roads in the rural areas. Loss of animal and plant resources.	To plan trees to protect the hillsides. To create civil protection service. To prohibit severely cut of trees in the hillsides.	Amount of tree planted annually by unit area. Number of units of protection service in the affected area.
Floods and marine invasion	Malanza, Praia Pesqueira, Santa Catarina, Abade. Pequenos e médios Agricultores e população residente	Mortality in the animals. Loss of some fruit trees and forest formation	To build dikes. Plantation of adaptable arboreal species to the vulnerability factors	Number of dikes built in the affected areas. Amount of planted trees
Whirl	Porto Alegre. Pequenos e médios Agricultores e População residente	Vegetation destruction, including forest formation	Construction of barriers with resistant trees to strong winds	Number of constructed barriers in the priority areas
Tempest line	Cadão.	Destruction of cultures and forest formation	Construction of barriers with resistant trees to strong winds	Number of barriers constructed in the priority areas.

Table 3. Crossing among impacts, vulnerability factors, adaptation measures and proposed projects for Health sector

Verified impacts	Vulnerability factors	Adaptation measured	Proposed projects
<p>-Increase of morbidity for malaria; -Losses of meat animals and domestic; -Increase of water diseases in matter the outbreak cholera</p>	Floods/pluvial-fluvial	Training and sensitization for behavior change (diseases of vector transmission and water origin)	<p>-Personnel's training and study visit</p> <p>-Sensitization for behavior change-CMC (diseases of vector transmission and water origin)</p> <p>-Creation of epidemic data base of potential diseases linked to CC</p> <p>-Data correlation of vector diseases, specially malaria, through GIS system with MARA/OMS initiative foreseeing the problem space risk, epidemic malaria</p> <p>-Elaboration of emergency strategic plans</p> <p>-To promote the increase and the application of the compulsory minimal education level (Education Ministry)</p>
<p>-Loss of animals Potential risk of building destruction and other infrastructures with the impact in the human being</p>	Coastal floods	Occupation of the coast line	<p>-Training project and sensitization of behavior change (construction of houses in safer places)</p> <p>-Construction project for protection line in charge of infrastructure sector</p>
<p>-Poly-traumatism and physical incapacity -Indirect decrease of the alimentary readiness and malnutrition</p>	Storms	<p>-Adapted construction to the strong winds</p> <p>-Definitive construction of houses</p>	<p>-Training medical and paramedical personnel</p> <p>-CMC</p> <p>-Mini-hospital of Campaign</p> <p>-Construction of safe houses in charge of Infrastructure sector</p>
<p>-Poly-traumatism and physical incapacity</p>	Land tumbling	<p>-Personnel's training</p> <p>-Equipped SNS (National health System) with materials and medical equipment/mini-hospital campaign</p>	<p>-Personnel's training project (costs already referred)</p> <p>-Acquisition of consumable materials and medical equipment (1.087.960 USD) and mini-hospital campaign (costs already referred)</p>
<p>-Increase of breathing diseases -Increase of conjunctivitis</p>	Drought	<p>-Personnel's training</p> <p>-Equipped SNS with consumable materials and medical equipment</p>	<p>-Personnel's training project (costs already referred)</p> <p>-Acquisition of materials, equipment, medicines and consumable (costs already referred)</p>

Table 4. Crossing among impacts, vulnerability factors, adaptation measures and projects proposed for water and energy sectors

Verified impacts	Vulnerability factors	Adaptation measured	Proposed projects
Decrease of rivers flow	Lack of water	Evaluation of water resources and definition of a country politics of water management	Evaluation and plan of water resources
		To management and monitor rivers	
Decrease of rains	Lack of agriculture and human consumption	Reintroduction of watering system	Reintroduction of watering system in the agriculture
		Sustainable management of water and energy	Sustainable management of water and energy
		Construction of a national laboratory of water	Construction of a national laboratory of water
Long Gravano	Climate alteration and lack of water	Sustainable management of water and energy	Reintroduction of watering system in the agriculture
Rising of sea level	Contamination of subterraneous water	Water treatment	Construction of water supply system Construction of a national laboratory of water Construction of water supply system
Rivers foods and consequent water contamination	Bad water quality	Water treatment	Construction of a national laboratory of water
Coastal erosion	Water invasion	Construction of barriers at coast al zone	Infrastructure project
Forest destruction	Bad firewood use and lack of energy source diversification	National utilization of firewood as source of energy and introduction of new technology for firewood and make coal wood	Introduction of new technology to use firewood and coal wood Through improved stoves
		Introduction of renewable energy (solar, eolic, biomass, etc ...)	Introduction of renewable energy (solar, eolic, biomass)

Table 5. Crossing among impacts, vulnerability factors, adaptation measures and proposed projects for fisheries sector

Verified impacts	Vulnerability factors	Adaptation measured	Proposed projects
Coastal erosion	-Progressive disappearance and decrease of the craft embarkation parks	-Immigration for other beaches (communities) -Improvisation of rustic lodging for their families -Parking embarkations near to the public roads -Rehabilitation of park and installation of harbors for the embarkations -Reloading of fishermen and their families	Construction of infrastructures for vulnerable fishing communities
Typhoon	-Forced abandonment of the fishermen and their families from the origin communities -Flood and submersion of craft embarkations in the high sea -Losses of materials, fishing equipment and own life(from fishing activity) -Decrease of fish provisioning at national market -Weak embarkations (small)	To provide a concentration of banks for fish at coastal zone. -To guide and alert fishermen for risk zone -Preventive broadcasting of weather situation -Improvement and reinforcement of embarkations (autonomy and navigability)	Integrated project of construction and installation of Device for Fish Concentration (DFC) and signaling coast zone
Fog	-Disappearance of fishermen and their embarkations in the sea -Lost of craft fishermen (1-3 days) -Diseases for privation of drinking water (dehydration, loss of conscience or death) Reduction of fish provisioning to the national market	-Reinforcement of craft fishermen capacity -Introduction of navigation orientation instruments, portable and easy to manipulate -Introduction of First Aid Kits in the craft embarkations -Improvement of meteorological information and easy accessibility for the communities without energy and television	Training project and introduce navigation new technology and fishing equipment for fishermen
Drought	-Decrease of growth area of alevins in the rivers estuaries -Increase of living cost of the communities' members in the access of the drinking water, vegetable and other first needs food -Frequent trees cuts for canoes construction -Shortage of materials to rehabilitate houses	-Sensitization communities' member of fishing zone to plant trees -Slow change of the tradition method of canoes construction with trunks of trees for a construction that avoid cuts of trees -Introduction of new types of houses construction	
Floods Isolation	-Forced displacement of the fishermen and their families home to the families no reached and less vulnerable -Increase of diseases (malaria, diarrheic)	-Sensitization campaign to fishermen communities members for adopted prevention and protected measures -Proposal of Government for intervention in the construction of barriers in the rivers mouth	

2. AMC calculation simulations

	Projects	1° Simulation		2° Simulation		3° Simulation		4° Simulation	
		Medium Value	Rank	Medium Value	Rank	Medium Value	Rank	Medium Value	Rank
1	Relocation of population at risk of floods and landfalls in Malanza, Sta Catarina e Sundy	0,65827	7	0,65176866	9	0,62745572	8	0,7223745	10
2	Beach rehabilitation and protection of tourist areas	0,437989	28	0,45919726	24	0,42770338	26	0,5733992	28
3	Construction of barriers, roads and bridges	0,445675	26	0,44886609	25	0,45530598	24	0,6059363	24
4	Establishment of a system of climate alert	0,781127	3	0,78899088	2	0,75012239	3	0,8005563	3
5	Construction of drainage ditches in Sta Catarina, Neves, Malanza, among others places	0,438088	27	0,3462923	31	0,32888409	32	0,6262408	22
6	Construction of dikes	0,460705	25	0,35948524	30	0,37471562	30	0,5891114	26
7	Rehabilitation of oceanographic	0,522397	23	0,48065755	22	0,41012239	28	0,6359099	21
8	Establishment of agro-tourist complexes at Monte Café and Porto Real	0,590476	16	0,6	12	0,54666667	14	0,6666667	18
9	T and study visits (doctors, nurses, volunteers, students, etc.for emergencies	0,595197	14	0,54719822	16	0,55330454	12	0,7180509	12
10	Acquisition of materials and medical equipment	0,418009	31	0,36050516	29	0,42927286	25	0,3966948	31
11	Acquisition of mini campaign hospital	0,482286	24	0,42392609	26	0,46204464	22	0,5082837	9
12	Communication actions for behavior change	0,793521	2	0,77955364	3	0,7487977	4	0,8521107	1
13	Elaboration of data base of potential epidemic diseases related tp climate change	0,619048	12	0,6	13	0,54	15	0,7575758	6

	Projectos	1° Simulation		2° Simulation		3° Simulation		4° Simulation	
		Medium Value	Rank	Medium Value	Rank	Medium Value	Rank	Medium Value	Rank
14	Rehabilitation and enlargement of sanitary network (4 buildings)	0,398622	32	0,39919606	28	0,38570194	29	0,2744028	33
15	Data correlation about vector diseases, specially malaria, through GIS system with MARA/OMS, initiative that foresees the problem of spatial risk (epidemic malaria)	0,562604	19	0,53929686	18	0,50048956	21	0,699195	13
16	Elaboration of emergency strategic plan focusing on health	0,627831	9	0,57734581	14	0,58614831	9	0,7612802	5
17	Sustainable management of forestall resources	0,530159	22	0,67777778	8	0,52666667	17	0,3373737	32
18	Integrated project of development on goat and cow raising in the north part of São Tomé island	0,635983	8	0,68580514	7	0,66296616	7	0,657927	20
19	Reinforcement and diversification of agricultural productions	0,695783	6	0,73920686	6	0,71704824	6	0,6017344	25
20	Construction of two system of drinking water supply in rural areas	0,765967	4	0,76348092	5	0,75951044	2	0,7280778	8
21	Evaluation and plan of hydro resources	0,547969	21	0,46964843	23	0,54691145	13	0,664749	19
22	Introduction of new technology for use firewood and to making charcoal	0,611286	13	0,60287977	11	0,58345572	10	0,6924755	14
23	Sustainable management of water and energy	0,570366	18	0,54197264	17	0,53036717	16	0,6915679	15
24	Construction of two hydro-power-stations at Claudino and Bernardo Faro	0,577953	17	0,50565755	20	0,50345572	20	0,6712634	17
25	Construction of a national water laboratory	0,425411	30	0,41852652	27	0,42223182	27	0,4485285	30
26	Introduction of renewable energy (solar, wind and biomass)	0,592763	15	0,53651908	19	0,51382289	19	0,7183869	11

	Proyectos	1° Simulation		2° Simulation		3° Simulation		4° Simulation	
		Medium Value	Rank	Medium Value	Rank	Medium Value	Rank	Medium Value	Rank
27	Construction of shelters and parking for artisanal fleets	0,627509	11	0,63086153	10	0,5237005	18	0,7279316	9
28	Construction and installation of Device for Fish Concentration(DFC) near to Coastal zone	0,729977	5	0,77396808	4	0,7387617	5	0,7994219	4
29	Training and equipment for the artisanal fishermen	0,809167	1	0,81831054	1	0,80197264	1	0,8372494	2
30	Strengthening of Human Technical Capacity- National Police	0,429871	29	0,32483201	32	0,35313175	31	0,612215	23
31	Strengthening of Human Capacity- Civil National Protection and Fire-Brigade	0,627683	10	0,57540797	15	0,55382289	11	0,7406091	7
32	Reinforcement of car parking:National Police	0,388707	33	0,26563475	33	0,31209503	33	0,5822501	27
33	Reinforcement of car Parking- Civil National Protection and Fire-Brigade	0,559961	20	0,49331054	21	0,46197264	23	0,6786635	16

1. Project title: Displacement of local communities

Localization: Santa Catarina, Malanza, Sundy, Praia Melão, Praia Pesqueira e Ribeira Afonso

Sector: Infra-structures and Public Works

Domain: Adaptation to Climate Change

Type: Community/ Social

Justification

For occasion of torrential rains and invasion of coast and beach at Santa Catarina e Malanza; consequently, it cause floods as the sea level rise. This community of fishermen, farmers that have to stop their activities, and put their family at risk of subsistence.

The poverty level of that local community requires extra interventions in terms of construction of infrastructures, since related with climate change

As a case occur at Praia Pesqueira, the house was reached by a ray in March of 2005, this is a good example.

Another case occurs at Praia Melão, where many canoes where destroyed, and others should be giving to the owners.

At Ribeira Afonso, Praia Melão and Praia Colónia, many houses are in risk of floods and need urgent intervention.

A construction of new homes as well as the communities' displacement, to face the Climate Changes phenomenon is necessary.

Activities composition

Objectives

To introduce measures to allow the local communities to face the phenomenon of climate changes, reducing the exposition of those populations to the marine floods and the rivers full.

Elaboration of notebooks of responsibilities, for:

Equipped the new chosen areas for the construction of new houses.

Activities

Construction and gives the new houses to the identified local communities' residents.

To supply electrical energy and water to the new homes.

Relocation of population at risk of flood.

Expected results

Vulnerable coastal populations put back in protected areas of the consequences of the climate phenomenon.

The communities' compensated of the harmful effects of the climate changes.

Execution

The execution controls of the project will be entrusted to Direcção de Obras Públicas e Urbanismo (D.O.P.U.) - Public Works and Urbanization Cabinet-, that will select the companies after acquisition of responsibility notebooks.

Institutional framework

The technicians of DOPU will elaborate the notebooks of responsibilities and they will drive the contest, release to the evaluation of proposals of the companies and award of the several works.

The national technical personnel's participation will be remunerated properly for execution and control of the project.

The identification of appropriate spaces for construction the group of the infrastructures will constitute task of the Geographical Services - Serviços Geográficos e Cadastrais.

The displacement of fishermen communities will need an appropriate sensitization campaign.

The new places should permit the main everyday activities of the communities' members.

Risks and obstacles

The choice of the models of the houses should have in consideration the lifestyle and the models previous of the communities.

Shortage of water and energy.

Reports presented from the inspectors teams of DOPU.

Monthly fishing campaigns.

Indicators for Monitor Regularity in the communities' daily activities.

Duration

6 months

Financial resources

500 000 USD

2. Project title: Establishment of a System of climate alert

Location: (INM) Airport of S.Tomé

Sector: Meteorology

Domain: Economic

Type: Adaptation to the Climate Changes

Justification

The meteorological forecast lacks of infrastructures and modern equipments, distributed by different stations of collects information and to be install for the whole Country.

The national meteorological net should be rehabilitated from way to allow a systematic observation of the climate parameters.

The technical and human means available in the institution are insufficients, to allow them to fulfill its function of safeguard of human lives and goods.

For the success of the established activity in the NAPA, the National Institute of Meteorology should be properly equipped and its staff adquatly trained.

Composition and activities

Disposal of infrastructures, human and technical means that guarantee the supply of information on time, permanently and credible.

To obtain information on the local and regional weather.

Objectives

To conceive a program in the radio, television and newspapers with permanent information.

To do meteorological forecasts.

To prevent the population, through a system of alert via radio or telephone, of the approach of a gale.

To sensitize the population to contribute in the maintenance of the infrastructures distributed by the several dispersed meteorological stations by the whole Country.

To give formation to the technicians on the new technologies in the domain.

Activities

To supply meteorological and credible information to the marine and aerial navigation.

To participate in events at local, regional and international level, to maintain the staff up dated.

To do the maintenance of the equipments and other infrastructures.
The marine and aerial navigation guarantee.
Forewarned population on any catastrophe, in advance.
Population sensitized.

Expected results

Equipments and infrastructures protected by the population.
Maintenance guaranteed.

Execution

The National Institute of Meteorology, in together with the Geographical Services, it will look for a land for construction of the central building.

The National Institute of Meteorology (INM) will take charge, together with DOPU, of the coordination and elaboration of the notebooks of responsibilities for work execution.

Institutional Framework

INM will proceed the order of the equipments.

INM will establish protocols in agreement with institutions as ENASA, ENAPORT, Direcção de Aviação Civil (Civil Aviation Direction), Direcção de Transporte e Comunicações, with reciprocal advantages about the air traffic and marine.

To find the wanted financing.

Risks and obstacles

To succeed in the population sensitization.

To do to arrive the information on the time to the interested populations.

Indicators for Monitoring

Fishermen and other informed navigators about the weather situation, before the accomplishment of their trips.

Entrance of S.Tomé and Príncipe for the group of the Countries of the area that possess, for considerable periods, database the weather.

Duration

12 months

Financial resources

500 000 USD

3. Project title: Establishing the agro- tourist complexes at Monte Café and Porto Real

Location: Agricultural company Monte Café, in S.Tomé, and Porto Real, in the Príncipe.

Sector: Tourism and Agriculture

Domain: Economic

Type: Poverty Reduction

Justification

The presentation of a new tourist product, based on the agriculture-tourism, innovator and original, tends in view to contribute in the combat against the drought and poverty reduction in the rural area, promising to be a good choice of the National Adaptation Plan of Action (NAPA).

On the other hand, the project will help the Government in the revitalization, rehabilitation and transformation of the agricultural infrastructures and it will build hotel infrastructures in referred companies.

Composition and activities

To reduce the effects of the drought on the cultures.
To provide to the tourists a different tourist package, with attraction inserted in the agrarian way and nature motivations out of the common.

Objectives

To improve the contribution of the agricultural sectors and the tourism in GDP.
To involve the local population in a new activity type.
To create new workstations and to reduce the poverty in the rural area.
To training and inform the population on the drought effects.
To consider the implantation as a pilot experience, whose success will depend on the existence of futures compounds.
To rehabilitate the facilities and to adapt them to the actual needs.

Activities

To sensitize the population for the advantages of the new activity.
To wake up in the population new energies and to obtain of her suggestions for new activities.
To create a young nucleus, with creativity, capable to always present new attractions.
Diversified tourist package and better.
Contribution of the sectors in increased GDP.
Larger affluence of tourists

Expected results

Motivated population and involved.
Reduced of drought in those companies.

Execution

Tourism and Hostelry Sector, together with agricultural companies involved in the process, will proceed to the fittings and constructions judged necessary and constant of notebook of responsibilities to be elaborated under the coordination of two Sectors.

Institutional Framework

Tourism and Hostelry will elaborate an appropriate tourist brochure and it will proceed to purpose internal popularization and in the exterior, in way to attract the potentials tourists.
DOPU will be called to grant the construction authorizations and to proceed the control, to define jointly The indifference of the populations can harm the process.

Risks and obstacles

The quality of the popularization can determine the success of the package.
Difficulties in obtaining financing will constitute a blockade to accomplishment.
Satisfied tourists with the quality of the presented services and motivated with the diversification and originality of the tourist offer.

Indicators to Monitor

Frequency of action of the local cultural groups and the increased area.
Drought locked in those tourist areas or agricultural companies.

Duration

9 months

Financial resources

600 000 USD

B) AGRICULTURE-LIVESTOCK AND FOREST SECTOR

Project title: Sustainable management of forest resources

Location: All National Territory

Sector: Forests

Domain: Forest management

Type: Program of Forest Development

justification

With the implementation of the politics of distribution of lands the small and medium farmers, associated to the demographic increase, started to exercise an enormous pressure on the woody resources, what will have as consequence the decrease of certain drastic species of wood of first quality. This can induce the degradation of the soils, the biodiversity loss, the degradation of the basins hydro-graphics, the progressive decrease of the great capacity of absorption of CO₂ that possess actually the solid ones forest santomenses, all this resulting in the deterioration of the life quality, above all of the rural For this reason, becomes vital that it is rotated in a maintainable way this natural system of stabilization of global climate. It is in this sense that the Government santomense decided to include in development program the sustainable management of the solid ones forest and the reinforcement of capacity of absorption of the country.

SãoTomé and Príncipe needs, for adaptation to the future climate conditions, a fort reinforcement of institutional capacities. The creation of a good base of data national is one of the great priorities, because it Will allow identifying the real needs of the country in terms of attendance.

Long term potential effects

The long term potential effects of implementation program are the following ones:

- The Forests sector qualified to accomplish with their relative attributions to management and application of the politics of the State regarding the forest sector.
- The tax of illegal exploration of wood reduced to minimum;
- Restored the potential of trees producing commercial woods and guaranteed wood the ecological balance of the forest ecosystems;
- Participative and rational managed forest space;
- All the actions developed in the forest sector according to the National Plan of Forest Development;
- Readiness of information and indispensable data for technicians for management and handling the ecosystems and the most important species;
- Lands forest vocation defined and officially recognized;
- Insured and increased the high consuming capacity of CO₂ of the forests santomenses.

Institutional framework

- The Forests sector of Ministry of the Economy will be the responsible for the program execution.
- The intervening potentials in the execution of project will be the Cabinet of Environment, the Services of Intern Order, the Autarchies, the Associations of the Small and Medium Farmers, NGOs whose identifies actions with the program objectives and all economics sector operators.

Risks and obstacles

The circumstances and factors that can come to embarrass the implementation program will probably be the following ones:

- To rise enough funds for financing the program;
- Deficient recognition of the importance of program for specific sector development of economy and for the echo-climate balance;
- Possible apathy of economics operators in the sector to certain components of

the program.

- Possible negligence of some institutions as potential intervention in the program execution;
- Weak acting of the national authorities in forest subjects;

Evaluation and monitor

The execution actions enrolled in the present program can be evaluated and following through the improvement verified in management of forest resources, translated by the following indicators:

- Forests sector executing the attributions that are assigned by the Forest Law;
- Significant " reduction of illegal trees cuts and less registration and less cases of illegal apprehensions for the reinforced services and contro of the forest activities;
- Exploration of the shadow forests and secondary in function of the established volumes for the detailed plan of forest exploration;
- Reforestation of the shadow forests and secondary, to evaluate through the number of plants introduced by unit area;
- Knowledge of the productivity of the forests and the real potential of existent wood, through reports of studies;
- A considerable number of forests managed actively for the bordering communities.

Financial resources

2.915.000,00 USD

Project title: Integrated Project of livestock development (goat and cows) in the north part of São Tomé island

Justification:

The conception and implementation of this project is justified because the lack of animal foods in the future, owed to the occurrence of the drought in the country, it can be very larger in the north area (Praia das Conchas, Planças,...) than in other country areas, since is quite vulnerable (semi-arid climate). It can have cattle losses, just as it happened recently in Kenya. According to the races, the goat is one of the species that more resists to the drought, it can feed with pastures of smaller nutritional value and to rarely drink water, when compared with birds and swine; it can produce milk, cheese and local meat that are products in deficit in the country; also, produces, on the other hand, the fertilizer for land fertilization, reforestation and rehabilitation of the pasture area and production of renewable energies as the biogas.

Potential effects to the long term:

The fomentation and increase of goat milk production can contribute to reduce the deficit of this product; the appropriate and rational use of fertilizer as organic fertilizer for the land fertilization; the production of bio-gas will benefit the farmer.

Institutional framework

This project is pilot type and it should be implemented by Livestock sector, through the establishment of dynamic partnerships with Agriculture and Forest, and Environment sectors and the international, bilateral or multilateral technical cooperation, for the area.

After experimentation period, if the result is satisfactory, it can be popularized at the level of the averages local companies and family creators more economic and technically developed. For implementation, it should be encouraging financing at level of the private sector.

Risks and obstacles

The local urbanization is a great risk for the project implementation, because it leads

to loss of areas that can be taken advantage for pasture. The lack of the creators' formation, the inadequate management and robbery can commit execution.

Evaluation and monitor

The indicators of progress must be select (effect, impact) Of project implementation, to know: Productive Performance (liter of daily milk / annual reproductive / cost, kg cheese / year, kg fertilizes / year, biogas / kw/energy), indicators of births (no. child-births / year...). Environmental indicators (animal load: no. of effectives/hectare of pastoral area, load..)

The evaluation and the continuation will be to do correct or appropriate adjustments to seek to improve the acting of project and to verify the defined objectives are or not to be reached her.

The project implementation demands however the application of the use of technologies and appropriate, rational practices appropriate, rational, integrated (biogas production, improvement of the forest ecosystem) and diversified (promotion of biodiversity) that seek to increase the production and simultaneously protect environment, contributing namely to the reduction of pollution and the greenhouse effect, phenomena that can be exacerbated with the intensification of the production system (implementation risks, aberration erosion for the introduction of other races).

Financial resources:

900.000,00 USD

Project title: Reinforcement and diversification of agricultural production

Justification:

The largest embarrassment of natural order in the agricultural sector is above all the lack of water, especially in the communities of central and north areas. The absence of an overhead irrigation make production lowering more and more in the foregoing areas. To this nature embarrassment added the following:

- Lack of political powers;
- Lack of private initiative;
- Aging of the plantations of cocoa and coffee;
- Inflation of prices of agricultural products;
- An insufficient productive lands due to the size of country and to volcanic substratum;
- Very accidental relief.

Institutional framework

The project execution will be in charge of agriculture sector of Ministry of Economy. The potentials intervening of project execution will be the Cabinet of Environment, NGOs, the Autarchies, the Associations of Small and Medium Farmers.

Risks and obstacles

- Extreme climate Factors (mainly linked to the temperature and the rainy);
- Attacks of curses and plants diseases;
- Erosion and soil with lixiviation;
- Floods;
- Lacks of a coherent agricultural politics;
- Lack of decision maker's engagement.

Avaliação and monitor

The actions execution enrolled in the present program can be evaluated and following through the following indicators:

- Increase in 50% the agricultural production;
- Increase in 10% the number of existent farmers' associations;

- Improvement of country trade balance;
- Increase in 80% the replanted agricultural surface;
- Increase in 5% the rural tracks;
- Increase in 10% the amount of inputs and distributed vegetable material;
- Multiplication for 25% the structures of economic boxes and credit;
- Increase in 70% the number of beneficiaries supported by the programs;
- Increase in 50% the small farmers' incomes and the entrepreneurs;

Financial resources:

1.650.000,00 USD

C) HEALTH SECTOR

I title of project: Training (doctors, nurses, volunteers, helpers students, etc..) for emergency needs and study visits

Starte date: 2007

Duration: 5 years

Justification

Some catastrophe situations that can happen, the country technicians are not prepared to do face the negative consequences that can occur of a natural catastrophe. In order to minimize this linked phenomena's to CC, the present project is prepared to face the situation.

Project description

There will be preparation of didactics material and several training (professionals of health and others) related to CC effects (extreme phenomena and others). the initial training of trainers will allow the subsequent training at several levels, being used for the effect and whenever possible, the human resources of the own institution. It will be prepared equally and trained the largest number of people possible, in order to help the massive intervention and in adverse situation, a catastrophe, always seeking the domain of the health and the articulation with the civil protection. In the project third year, the people's recycling will be accomplished previously formed. In this regards, they are in equal way foreseen study visits to countries with identical situation and more advanced preparation, with the objective of exchanging experiences in that domain.

Potential long term Effects

Technicians of health, Agents and Volunteers formed in emergency intervention in cases of catastrophe, above all the ones that can occur of climate changes.

Institutional Framework

The project execution should be making by Cares Service from Health of Ministry, in collaboration with Statistics Sector.

Objective

To qualify about 500 men and women for interventions in combat to problems of health linked to CC, emphasis in emergency situations provoked by any catastrophe.

Expected Results

500 men and women formed:

Technicians of health formed and ready for emergency;

Volunteers formed ad ready for casual emergency;

Civil protection formed and ready to helps in cases of natural catastrophes.

Beneficiary:

Professionals of health, volunteers, elements of the civil protection.

Interventions Execution strategies

Accomplishment of training actions (theoretical and Practical);

Use of some acquired equipments for the accomplishment of the clinical practice;

Accomplishment of study visits to countries with larger experience or in catastrophe situation.

Budget:

USD 22.000,00

Project title: Communication action for behavior change

Start date: June 2007

Duration: 5 years

Justification

Some risk behaviors, was verified during the bibliographical revision as in collects the information where the increase of impact and linked vulnerability factors to the climate changes (CC). The linked vulnerabilities to CC have effect on the propagation of the water diseases, vector and other. With view to minimize the negative effects of the linked phenomena to CC, it is conceived the present project seeking to change positively the population behavior.

Project description

This project has objective to inform and to sensitize the population for the change behavior as for the prevention of diseases related with water, of vector transmission and other problems of health linked to CC. It will be to purpose to include component counseling of family planning. It will take place advocacy to the decision makers and the population in the sense of the need of construction of safer houses, as one way to minimize Climate Changes consequences. The activities will be organized with emphasis in the priority group-objective, through several communication ways.

Long term Potential Effects

Smaller number of deaths cases for water diseases and vector and poly-traumatized as a consequence of CC effects.

Institutional Framework

The project execution should be in charge of Care Service of Health Ministry, in collaboration with Meteorology and the Social Communication Sector.

Objective

To contribute for change of people's behavior in STP, in way the best they adapt to possible factors of vulnerability face to CC.

Expected Results

Formed and informed population for possible vulnerability factors;
Formed and informed population relatively to personal and environmental hygiene;
Formed and informed population relatively to linked healthy practices to prevention linked diseases to CC;
Formed and informed population/decision makers and informed relatively to the need of safe houses construction of safe houses.

Beneficiary:

Students, teachers, political decision makers and target communities

Interventions Execution strategies

Accomplishment of CMC actions in the communities, through NGOs;

Accomplishment CMC actions in schools, through NGOs;

Broadcasting radio and television program for change

Risk behaviors;

To accomplish advocacy to the decision makers relatively the need of safe houses construction of safe in way to face to CC.

Risks

The costs of communication materials are increasing in a galloping way, what can come to reach unexpected levels, with the consequent decrease of performance and/or the cost preview in the project.

Evaluation and continuation

The project starts with an inquiry to obtain the base data and another in the year 4 of execution. A plan of periodic monitor of activities will be prepared, according to the annual plan of operational execution to be prepared. To begin the project execution, they will be prepared and validated the evaluation and monitor plans.

Budget:

USD 150.000,00

Project title: STP - Create an epidemic data base

Start date: 2007

Duration: 5 years

Justification

During the elaboration of this proposal, we had shortage of base data to illustrate some situations of epidemics and/or outbreaks of certain diseases that happened in country linked to Climate Change (CC). The lack of regular registration of climatologically data was verified, including the variability of these, linked data to catastrophes happened in country as well as inadequacy of systematic epidemic data from decades.

All these situations hinder the crossing and analysis in what respects to the meteorological data, of extreme importance to guide or to draw guidelines for the possible interventions in the area of health, in way them have smallest possible impact the consequences of CC.

To endow the country with these data is the goal of present project.

Project description

It is the data base compilation of diseases of vectortransmission, of water origin and another linked to CC. It is proceeded to the subsequent registration and systematic processing data on such diseases and crossing them with the meteorological data as well as of to analyze and to do the possible forecasts. To create a system of epidemic alert that guard against the sanitary institutions so that it can organize to do face to eventual abnormal situations.

On the other hand, this system will supply elements for the monitor and evaluation of effects of some actions foreseen in the extent of other linked projects to CC and to constitute base reference for a more adaptable future planning.

Long period**Potential Effects**

The Country will have a data base for the elaboration of strategies and forecast of epidemic situations that can occur of CC

Institutional Framework

The project execution should be in charge of Cares Health Sector of Ministry of Health, in narrow collaboration with Statistics sector.

Objective

To reinforce the system of epidemic surveillance of health, with emphasis in the diseases linked to CC problem.

Expected Results

Data base installed and functional

Beneficiary:

Ministry of Health. Indirectly will benefit the population.

Interventions Execution strategies

Acquisition and installation of informatics equipment;
Organization and definition of tasks for the involved technicians;
Systematic collection and analysis of the epidemic data;
Request of meteorological information to the competent institutions;
Regular diffusion of obtained results to the interested institutions.

Risks

The costs of informatics materials are increasing in a galloping way, with the consequent decrease of the performance a/or covering foreseen in the project.

Evaluation and monitor

The project will start with an inquiry to know the needs.
It will be prepared an evaluation monitor plan of works equally as well as the collects and data treatment.

Budget:

USD 22.000,00

Project title: Geographical Information System (GIS) for the environmental surveillance as regards to health

Start date: 2007

Duration: 5 years

Justification

The need of systematized data, to decide, to monitor and to evaluate conveniently is a reality. At this time, the endemic malaria, face to the impact of varied interventions in course and, particularly, the intra-domiciliary pulverization with insecticide, tends to pass to epidemic malaria. In this situation, the forecast of risks is crucial for minimize human lives losses. STP, through the present project, can benefit of other country experience, the one that would allow save stages.

Project description

A service of GIS will be developed in health that will integrate the existent information's/systems, using the available data base through the project MARA/OMS for control malaria in Africa. It will be installed a central structure and other outlying ones that will work with the indispensable support of computer sciences structures and the Web. The installation process and the national technicians' training will count with support of international experts. To Complement the actions, periodic visits of study during three of the five years of project. They will be compiled and introduced all of published information and no published concerning the vector diseases linked to CC, particularly the malaria, the way to foresee the space risk in each district or area. It will be equally systematize the risk level disease linked to CC. This project has related with the project of Creation of Data Epidemic Base.

Long Term Potential Effects

Larger capacity of STP to prepare for a potential epidemic, particularly of malaria, and consequently prevent/minimize human lives losses.

Institutional Framework

The project execution should be Cares Services (Epidemiologic Department) of Ministry of Health, in narrow and indispensable collaboration with the Endemic National Centre.

Objective

To develop the national system of environmental surveillance as regards to health, with emphasis in the malaria, the one that will allow foresee the risks, in agreement with to inhabited geographical areas for the populations.

Expected Results

Installed system and functional of geographical information (GIS) for the environmental surveillance as regards to health, particularly for evaluation of the risks, in agreement with the inhabited geographical areas for the populations.

Beneficiary:

Ministry of Health. Indirectly will benefit the opulation.

Interventions**Execution strategies**

Installation of the service GIS;

Training the country personnel's, with the support of international technical support and accomplished through study visits;

Map of the space risks (geographical) of the malaria;

Collect and analysis of information;

Generalize the information to the concerning structures.

Accomplishment study visits to countries with larger experience or in catastrophe situation.

Risks

It depends on the international partners' collaboration, particularly of Project MARA/OMS for malaria control in Africa, being verified the need of a larger precision in the space forecast, for the fact of STP to be disposal just of 1001km² of surface. However, this project will focus on control of the malaria in Africa, to minimize the risk.

Evaluation and continuation

As a project starting, there will be an initial rising with the support of the international technical, that it will be to delineate the compatible plan of monitor and evaluation during the five years of Project.

Budget

USD 22.000,00

Project Title: Elaboration emergency of strategic plan focusing on health

Start date: June 2007

Duration: 5 years

Justification

This project will face the impacts of the vulnerable factors linked to climate changes, necessary if it turns the elaboration of a strategic and emergency plan and emergency. For the elaboration of which intends in the beginning of the implementation of the necessary actions.

Project description

This project includes two components: one of strategic planning and another of preparation of emergency plan. A team work is foreseen that will be devoted to the auscultation, compilation of information and preparation, in a first stage, of the emergency plan and, on the second stage, of the strategic plan in the domain of the health

to work with linked problems to CC. It is a participative process that should be validated in each one of their stages.

Long term Potential Effects

The Country will have an elaborated strategic and emergency plan allowing to the technicians to face the negative effects in what concerns to the prevention as to the healing part, in case it happens in STP any catastrophe provoked by climate changes.

Institutional Framework

The execution of this project should be confident to Ministry of Health.

Objective

To reduce the negative impact of the effects that can occur of CC.

Expected Results

Emergency plan, Health sector, for preparation of action face to the consequences of the phenomenon of CC. Strategic plan, health sector, for prevent/minimize, the current consequences of the phenomena of CC at long and medium terms.

Beneficiary:

Ministry of Health. Indirectly will benefit the population.

Interventions

Execution strategies

Creation of multidisciplinary team work;
Collect and analysis of the information;
Presentation and discussion of the plans;
Validation of the plans;
Mobilization of resources for implementation..

Budget

USD 36.000,00

D) WATER AND ENERGY SECTORS

Project title: Construction of two systems of drinking water supply in rural zones

Location: S.Tomé and Prince Two rural systems

Sector: Water

Justification:

Great part of santomense population doesn't have drinking water their houses. Some people have systems of holes even, without any appropriate treatment.

Given the easiness of finding courses of water as well as sources, small systems can be built with due treatment, also using renewable energies. Those systems can be managed by the own community properly organized.

Detailed of project description:

General Objective:

To supply the STP population with drinking water.

Specific Objectives:

To increase the amount of population covering of drinking water;

To reduce the incidence of the diseases related with water;

To contribute for the reduction of the infant mortality tax.

Activities:

- Construction of systems of water supply with treatment;
- Installation of systems of treatment of water;
- Training of personnel;
- Sensitization of population;
- Creation and attendance of local structures.

Contributions:

International organizations, NGOs

Expect results:

Systems of water supply functional;

Poverty Reduction in the country, with incidence in the improvement of the conditions of the women's life;

Reduction of diseases related with water.

Implementation:

Institutional Framework

Project to be executed by EMAE, autarchies, private sector,

Risks and obstacles

Storms, institutional Obstacles.

Control:

DRNE, ministry of Health,

Indicators

Affected population

Costs:

1.000.000 USD

Project title: Evaluation and planning the hydro resources

Location: The whole country, Democratic Republic of S.Tomé and Príncipe

Sector: Water

Justification:

STP has a high number of courses of water, having been formerly identified about 223 courses of water and 116 basins hydro-graphics, data that lack of an actualization in terms of the amount and quality, as could be verify in the inquiries. Relatively to the underground waters, measurements don't exist and they still didn't have any research rehearsals for a trustworthy evaluation of that resource. It is necessary that we know what we have to plan the use for the several needs, as they are the supply of drinking water, the supply of water for the agriculture, the livestock and the production of electrical energy, the use for industrial needs and of services rendered. Such knowledge also impose because of the effects of climate alterations in the process of water management in the country.

Detailed description of project:

Objectives

- To evaluate the readiness of the natural resources;
- To protect its quality;
- To plan its use;
- To develop national competences for the integrated management of the water resources;
- To institute a national system of management of water resources.

Activities:

Collect of existent information. Acquisition and installation of hydro-metric equipments, reinforcement of the attendance services and improvement of management, elaboration of codes, training and up dated for human resources, creation of a database and improvement of the knowledge on impact of climate changes in the water resources

Contributions:

State Santomense and international organizations

Expected results:

- Structures that allow researches hydrological and hydro-geologic properly installed and in operation;
- Implementation of a national system of information and of monitor relatively to the water resources
- Elaborate and implement legislation and regulation, with practical modalities of application very defined;
- Institutionalization of management system, with the purpose of putting in practice the national politics of the water resources.

Short term results

Management improvement of the water resources.

Implementation:

Institutional Framework:

Implementation of local and regional structures that make possible the application of the politics in the whole country.

Risks and obstacles:

Disastrous climate Factors, institutional Obstacles.

Control:

Supervision of DRNE.

Indicators:

Elaboration of the Legislation;
Rining and specialization of personnel's;
Hydro-metric equipments installed.

Cost:

400.000 USD

Title of the project: Introduction of the new technologies for firewood use and to make charcoal

Location: The whole country, focusing on rural area

Sector: Energy

Justification:

Great part of santomense population uses firewood to cook. The firewood coal is in equal way quite used, due to price in comparison with the other types of energy. Like this, we have been verifying a very irrational consumption of firewood in the whole country, leading to a very inadequate use of forests. It is necessary that new technologies give the population others resources of energy.

Description**Objectives:**

Reduction of consumption of firewood and better use of the national forests.

Activities:

Construction of improved stoves;
Introduction of new technologies for manufacture firewood coal;
Sensitization of the population.

Contributions:

No government Organizations -NGOs.

Short term results

Introduction of new technologies;
Poverty reduction.

Expected results:

Reduction of the consumption of firewood;
Reduction of the gases with greenhouse effect;
Improvement of the standard of living of poorest populations.

Implementation:

Institutional Framework:
Project to be executed by rural communities and NGOs

Risks and obstacles:

Resistance to the new technologies; Institutional obstacle

Control:

Natural Resources and Energy and Forest Sector

Indicators:

Improved stoves.

Actual situation:

Inexistence of improved stoves.

Source:

Group of consultants.

Value to reach:

Intends to publicized the use of improved stoves and to introduce modern technologies for manufacture wood coal.

Costs:

500.000 USD.

Contributions:

State santomense, private sector and international organizations.

Project title: 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.

Detailed description of the project:**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 approxi-

mately 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.

Costs:

300.000 USD

Project title: Construction of two hydro power-stations.

Location: Bernardo and Claudino Faro

Sector: Energy

Justification:

STP possess great potentialities for hydro-electricity. This type of energy contributes to the decrease of the emission of gases and it allows taking the electricity to the poorest.

Detailed description of the project:

Objective:

Electrification of the rural area.

Activities:

Study of the environmental impact;
Electrification of the rural area, using clean energies;
Construction of hydro-power-station using technologies relatively simple.

Contributions:

International organizations, NGOs.

Short term results:

Electrification of all STP, especially the rural area.

Expected results

Rationalization of the water resources;
Rural development;
Decrease of population exodus for the cities.

Implementation:

Institutional Framework
Project to be executed by the communities, with the support of DRNE, EMAE and private.

Risks and obstacles:

Institutional obstacles.

Control:

Natural Resources and Energy sector.

Indicator nº 1

Hydro-power-station constructed

Actual value

They exist in the country only 4 power-stations in operation.

Source:

Study of the Potential Hydro-electric of S.Tomé and Príncipe. INDES - RDSTP - May of 1996.

Value to reach

To build, in the rural areas, 2 power-station with potency among 50 KW to 300 KW.

Indicators nº2:

Installed potency.

Actual value

1.500

Source:

Study of the Potential Hydro-electric of S.Tomé and Príncipe. INDES - RDSTP - May of 1996.

Value to reach:

10 000 Kw

Costs:

500.000 USD

Project title: Introduction of renewable energies (solar, wind and biomass).

Location: Rural places where supply of electric energy doesn't exist.

Sector: Energy.

Justification:

STP has potentialities at the level of solar energy, eventually of the eolic and of the biomass. Because, to the moment, certainly for ignorance, the country has not been removing advantage of those types of energy.

It's necessary to know about it that is the purpose of this project proposal.

Detailed description of the project:**Objective:**

Effective utilization of renewable energy.

Activities:

Rising of the data;
Creation of services;
Installation of measure equipments;
Personnel's formation at several levels;
Projects elaboration and execution.

Contributions:

State santomense, NGOs, international Organizations.

Short term results

Improvement of life of poorest populations.

Expected results

Use of national resources; Reduction of gases with Greenhouse effect; Rural development;

Implementation:

Institutional Framework

The project will be in charge of Natural Resources and Energy and the Forests sectors.

Risks and obstacles:

Current institutional obstacles because it's a subject less known and need a multi-disciplinary involvement.

Control:

DRNE.

Indicator 1

Training human resources

Actual value

Doesn't exist tantomense training in this domain

Value to reach

Training human resources in different fields: solar, eolic and biomass energy

Indicator 2:

Installed equipments

Actual value

Only 8 small solar systems that supply the system of radio communication.

Source:

Consultants teams.

Value to reach

To introduce, specially, in the rural areas, systems of production of alternatives energy for school, hospital, small industry, etc..

Costs:

500.000 USD

E) FISHERIES SECTOR

Project title: Construction of infrastructures for protection of Vulnerable communities

Justification:

The effects of coastal erosion, the floods and the invasion for the marine waves have been coming to echo in the reduction of the resources of fishermen and of their families, taking them impoverish every day that passes, the current advantages of this project would allow to overcome the situation

For the effect, the present project interferes in a complementary action to the vast program of Government for the protection of the coastal area of S.Tomé and Príncipe, in peculiar of the fishing affected communities.

It is intended with it the gradual construction of harbors and protection barriers, as well as the recovery of the parks of canoes of the communities' of Pantufo, Malanza and Ribeira Afonso.

This action will obey previous multidisciplinary consultancy, to establish of execution plans and methods to proceed for the execution of the project.

This will request implantation the specialists' technical support and it should be implemented in narrow

collaboration with institutions connoted with the theme, among them the Ministry of Infrastructures, the local autarchies, etc.

General Objective

The protection of coastal areas and target communities of S.Tomé and Príncipe.

Specific objective

To involve the target groups in the preservation and treatment of the spaces destined to the disembarkation and parking of the canoes;

To lock or to reduce the progress of degradation of the coast, through the completion and construction of protection barriers;

To improve the parks of the embarkations of craft fishing and installation of harbors;

To build bridges for fishing fleets in the degraded areas and to facilitate the permanence of the fishermen in their origin communities.

Long term potential effects

Reduction the more than 50% of the number of that are dislodged of their origin beaches;

Development of new economics activities in the communities of fishermen and, consequently, of standard of living of their members, elevating in more than 60% the respective income;

Increase of the year of life of the canoes.

Institutional framework

The project is framed in the Government's program, particularly in the domain of the fishing and infrastructures, since the group objective is the craft fishermen.

It is treated, on the other hand, of a priority action that it seeks to reduce the poverty.

Risks

Lacks or financing inadequacy

Inadequate control in execution of norms for an effective work conclusion .

Evaluation and continuation

Evaluation and monitor

General Objective	Specific Objective	Expected Results	Activities	Indicators			Cost in (\$USD)
				Actual value	source	Value to reach	
To protect the coast target communities of São Tomé and Príncipe	1- Develop participative preservation of canoes parks.	Sensitized 60% of communities leaders in the preservation process	-Sensitization - and organization of community -Selection of teams work - Training -Execution of parks management	2- Exist two protected zones: one in Príncipe island and other in São Tomé	Inquiry	More 6 zones: 2 in Príncipe and 4 in São Tomé	60.000
	2- Reduction of coastal erosion and degradation of embarkations parks	-More than 50% of target zone rehabilitate; -4 barriers constructed	- Study and map of the zone; -Elaboration of rehabilitation plan and barriers to be constructed	Doesn't exist		-6 parks rehabilitate d; -3 barriers constructed	130.000
	3- Improve anchors parks for craft fleets	Anchors constructed and ready to be used by craft fishermen	-Organization of target zones; -Elaboration and approbation of anchors plan; -Execution, monitor of actions; -Monitor final report	Doesn't exist.		More than 10 anchors at all country	110.000
TOTAL							300.000

Financial resources:
300.000,00 USD

Project title: Integrated Project of construction and Installation of Device for Fish Concentration (DFC) and signaling coastal zone

Justification:

Assisting to the characteristics of our platforms, and the archipelago to be volcanic origin and of being very uneven our sea bottom, most of the time the fishing areas are quite distant of the origin beach.

On the other hand, our ZEE disposes of many migratory species. The tunas *Katsuwonus pelamis* ", " *Thunnus albacares* ", locally known by Zudê and Oledê, respectively, they are among other species that move in the coast inside of the 12 miles, in the high sea, in the 200 miles, or still, of north to the south of the continent. Such movement implicates dislocations of fishermen for distant areas, what doesn't rarely provoke accidents and/or sudden deaths, when been hit by fog, strong winds or even torrential rains, the one that associates the physical exhaustion of hours of navigation and the lack of visibility for orientation.

In this conjuncture, if the devices of fish concentration be installed near of the coast, a lot of species will be attracted and consequently an area of close fishing will be constituted and free from great risks for the fishermen, which would be protected of the effects of tempest lines (very strong winds) as well as fogs.

In this circumstance, to facilitate the navigation and to avoid other accidents it would be imperious that these DCP went pre-signalized, even to facilitate theirs destruction for ships of great load.

This project will benefit more than 15 communities, being 10 in S.Tomé and 5 in the Principe, and will have a cost of \$250.000 USD, with duration of 24 months.

In the end of the project, the communities will be prepared for the appropriation acquired knowledge and the perennity of the actions accomplished by the project.

General Objective

To put to the disposition of craft fishermen profitable and closer fishing areas of the respective beaches.

Specific Objects

To increase the production and the productivity and to reduce the fishing effort;

To reinforce the participation and promotion of the Self-construction of DFC for the communities' members;

Improvement the physical conditions and the incomes of fishermen.

Long term potential effects

Larger proximity to the coast of the fishing areas;

Reduction of fishing hours and capture increase for the craft fishermen;

Reduction in more than 50% the material losses during the fishing;

Improvement in the family economy and the children's education..

Institutional framework

The project will be executed in partnership of Fishing sector with NGO MARAPA and it will count with the Coasta Guard's collaboration, being under the protection of the Ministry of Economy.

Risks

Attempt of vandalism and destruction of DFC for some fishermen or for foreign embarkations using nets or stands as fishing arts.

Evaluation and monitor

General Objective	Specific Objective	Expected Results	Activities	Indicators			Cost in (\$USD)
				Actual value	source	Value to reach	
To put to the disposition of craft fishermen profitable and closer fishing areas of respective beaches	Reinforcement of participation and promote self-construction of DFC by the communities members.	-Engaged fishermen to built theirs own DFC; -DCP constructed and installed in all country.	Sensitization of craft fishermen; Selection of target group and training them; Identification of zones to install DFC; Acquisition of materials, construction and installation of DFC.	Doesn't exist		25 Groups. 20 Communities. 25 DFC.	180.000
	Increase the production and the productivity and reduction of fishing effort.	Increase the quantity and the quality of captured fishes by craft fishermen .	Weekly revision of installed DFC; Team group experimental fishing; Improvement and implementation of DFC with some fishing techniques.	Doesn't exist.		5 DFC Weekly. 10 / Months 3 -10 new techniques / year.	35.000
	Improvement of physical conditions and the income of fishermen.	Stimulate socio-economic activities; Increased the income by embarkation .	Strut ration of other modalities of commercialization of fish; Search of alternative markets in case of great production; Search of alternative markets in case of great production; Evaluation and monitor of actions.	A cooperative of fish commercialization; Dbs 4.166.666/ month	NGO MARAPA Fisheries sector	3 new fisheries cooperative; Dbs 8.000.000/ month.	45.000
TOTAL							250.000

Financial resources:
250.000,00 USD

Project title: Training and readapt Project of the new navigation Technologies and fishing equipment for fishermen

Justification

Given the countless occurrences of climate phenomena that happen on the craft fishermen of S.Tomé and Príncipe and considering that for several years and for varied generations these continue traditionally to use the same types of materials and embarkations, that in more than 95% are weak autonomy and without any navigation device, and they go fishing and sometimes impeded of returning to the house.

Such situations are frequent and they happen annually when, the fishermen are surprised by storms, tempest lines, fog, strong rains, etc.

The fishermen were served during years of empiric knowledge (experience practices) of navigation, being guided by the moon, stars, the sun or the relief's (picks of S.Tomé and Príncipe) as reference cardinals for to return to the origin beaches. If, for any reason, any climate factor obstruct those traditional coordinates, they are immediately seriously committed and uncertain to return to the beach or, even, be shock by embarkations of great load.

Then the need of they be prepared and equipped in order facet the situations and minimize the constraining effects of the climate factors.

It was suggested the present project to focus in this matter. It will be executed by sector of Fishing, in collaboration with NGOs, MARAPA and GIEPPA. During execution, it should count with the collaboration of Institute of Meteorology for preventive information of weather as well as with the "Companhia Santomense" of Telecommunications (CST) in the domain of communication.

The beneficiaries will be selected according with the vulnerability results verified in the inquired communities as Well as in the no inquired but susceptible to CC effects.

The number of beneficiaries will be superior to 200 fishermen, distributed geographically by the two Islands and involving al Districts.

The cost of the project will be of approximately \$350.000 USD

General Objective

Reinforcement of capacity of craft fishermen to minimize the perverse effects of the climate changes.

Specific Objective

To allow a sustained development of craft sector;

To improve the capacities of navigation of fishermen, in way to minimize the effects of climate changes, facilitating equipments and materials to subsidized credit (GPS, compasses, embarkations with better capacity, lifejackets and signaling rockets).

Long term potential effects

Improvement, in more than 60%, the work conditions and income of craft fishermen;

Reduction, in more than 70%, the accident risks or life loss.

Institutional framework

The project will be executed in partnership with Fisheries sector, NGO, MARAPA and of GIEPPA, with the Coastal Guard's collaboration, and it will be under the protection of the Ministry of Economy.

Risks

Incoherent Selection of target fishermen and vulnerability susceptible.

Impartiality in the attribution of subsidized credit of materials and equipments.

Evaluation and monitor

General Objective	Specific Objective	Expected Results	Activities	Indicators			Cost in (\$USD)
				Actual value	source	Value to reachr	
Reinforcement of craft fishermen capacity to minimize the effects of CC	Stimulate sustainable development of craft fishing activities.	Fishermen with theoretical and practical knowledge about climatic factors that cause bad effects ; Change behavior and improvement of fishing practice face to climate change.	Popularization the effects of climate change on the population; Seminars on the community; Select the focal points to do communication and sensitization systematically.	50	Fisheris sector.	1200	100.000
	Improve the navigation capacity of fishermen to minimize the effects of climate change.	Fishermen capacity; Fishermen equipped; Decrease the number of disappearance in the sea; Improvement of live level of fishermen and families.	Sensitization and selection of fishermen; Acquisition of equipment; Training of fishermen; Distribution; Monitor and evaluation of action.	80	Fisheris sector.	1000	250.000
TOTAL							350.000

Financial resources:
350.000,00 USD

