



**United Nations**  
Framework Convention on  
Climate Change

**The Democratic Republic of  
Sao Tome and Principe**



**The National Natural Resources Institute of Meteorology of the  
Ministry of Infrastructure, Natural Resources and Environment**

# **Expert Group and the expert meeting to assess progress made in the process to formulate and implement National Adaptation Plans**

*9 February 2018  
Sao Tome, Sao Tome and Principe*

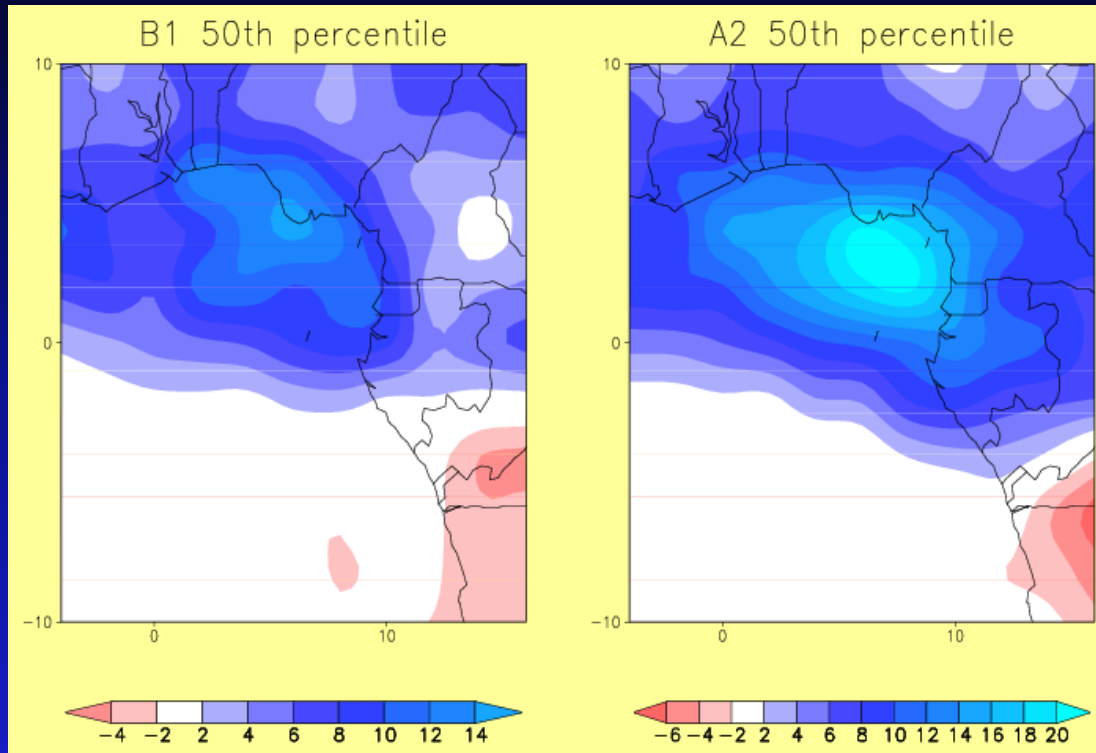
**Aderito Santana**

# STP Adaptation to Climate Change Project (for Vulnerable Coastal Communities) (GEF TF099869-ST)

*Project summary and  
Early Lessons  
Learned*



# Justification

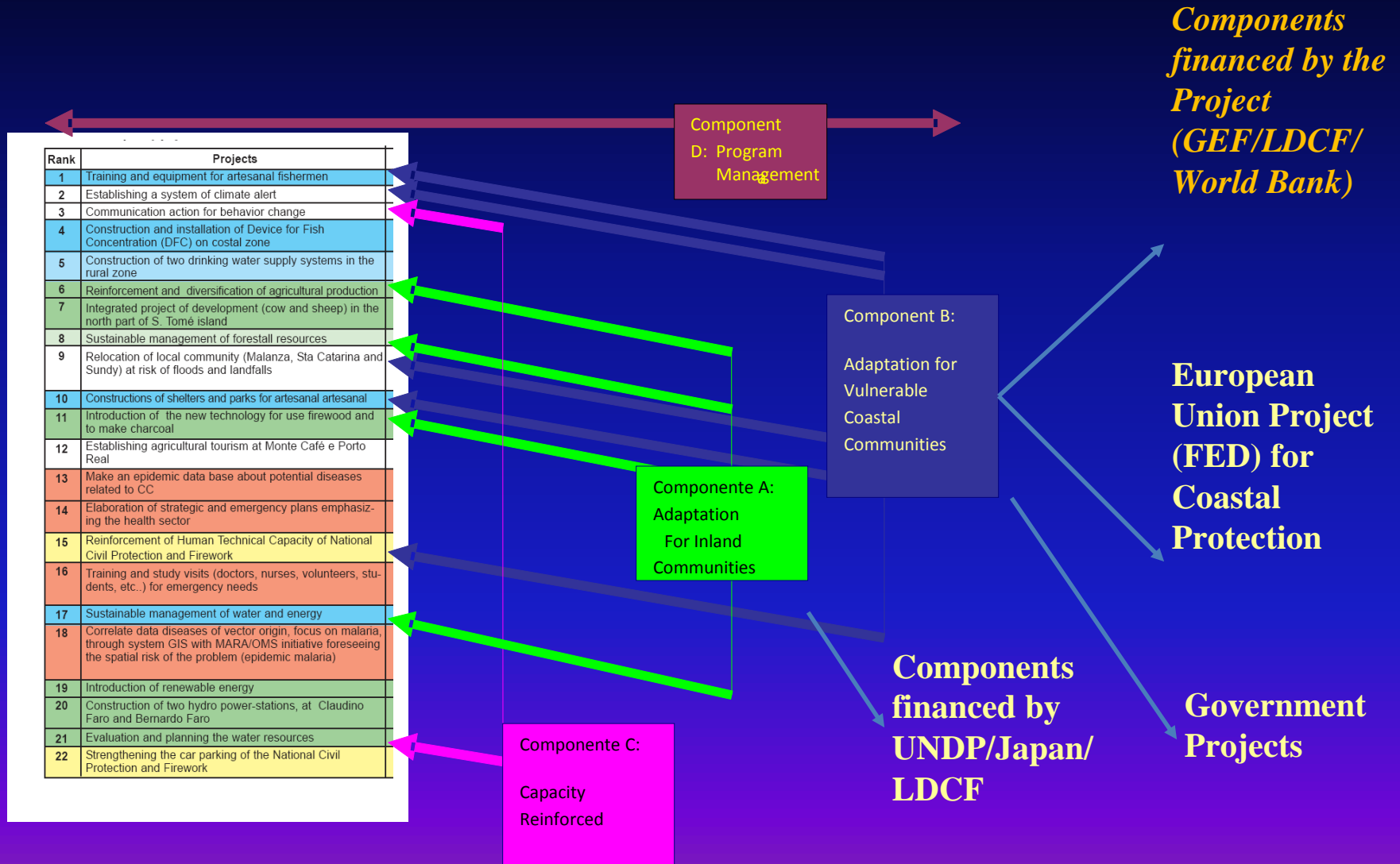


***Median increase in precipitation projected for 2040-2060 (mm/month) in September –November***

**In general, it is expected that climate change in São Tomé e Príncipe will have the following effects:**

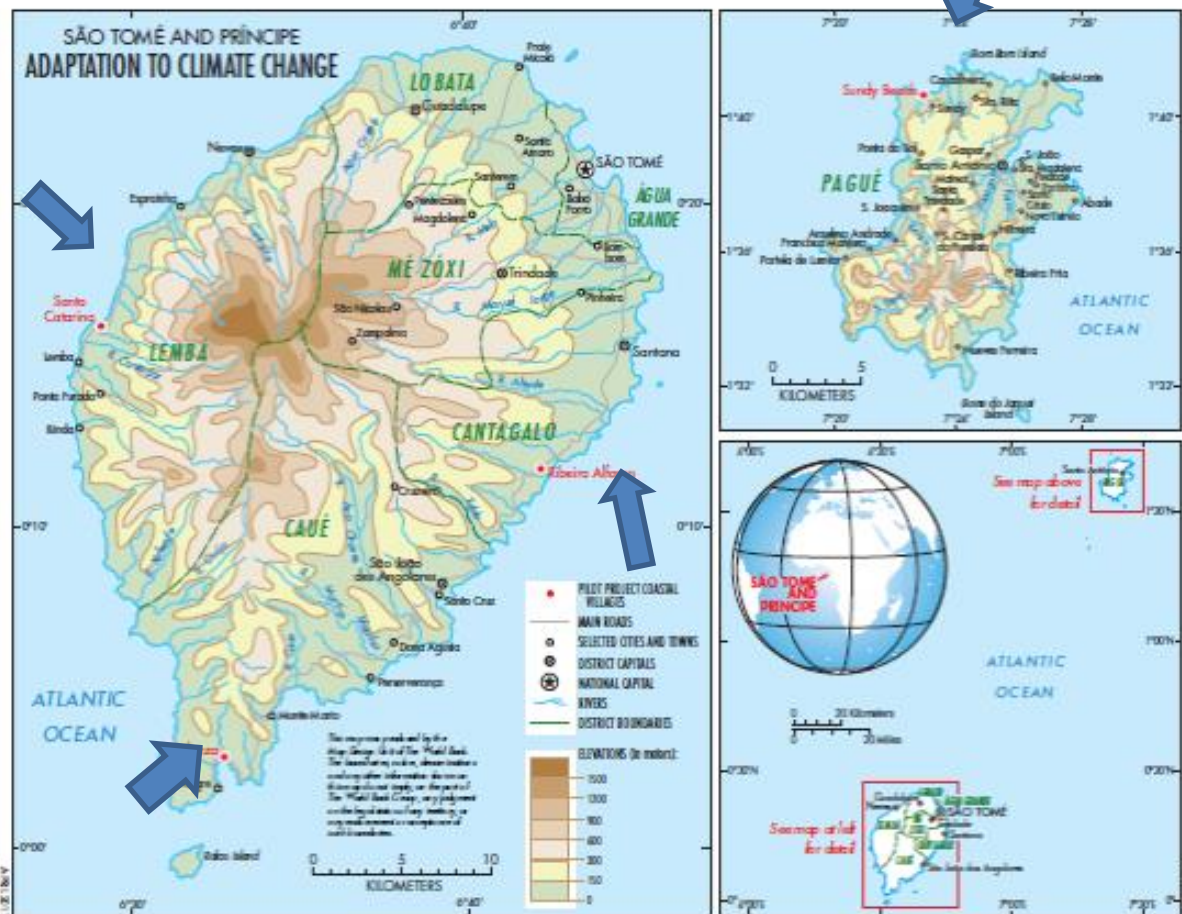
- *A rise in temperature of 1-2 C by 2050*
- *Drier seasons in March-May*
- *Increased precipitation during September-November*
- *Stronger winds in December-February, and potentially more fog, reducing the visibility to the fishermen (who navigate by sight)*

# The Project is part of a broader National Adaptation Program which includes several partners



# Location of Pilot Communities

*The Early Warning and Safety at Sea component is national in scale.  
The Protection of Vulnerable Communities focuses on 4 pilot communities:  
Ribeira Afonso, Santa Catarina, Malanza e Sundy*



# S. Tomé e Príncipe:

## Project GEF: Adaptation to Climate Change – Coastal Areas

**Objective:** *To increase the adaptive capacity of vulnerable coastal communities in São Tomé e Príncipe to the adverse impacts of climate change and variability*

### The Project has three components:

#### 1. *Coastal Early Warning System and Safety at Sea (US\$1.9 M)*

- 1.1 System of Early Warning
- 1.2 Safety at Sea for Artisanal Fishers

#### 2. *Coastal Protection for Vulnerable Communities (US\$1.8 M)*

- 2.1 Community Preparedness
- 2.2 Coastal Protection for Vulnerable Communities
- 2.3 Coastal Policy

#### 3. *Project Management (US\$0.4 M)*

**Total US\$4.1 million**

# S. Tomé e Príncipe:

## Project GEF: Adaptation to Climate Change – Coastal Areas

**Objective:** *To increase the adaptive capacity of vulnerable coastal communities in São Tomé e Príncipe to the adverse impacts of climate change and variability*



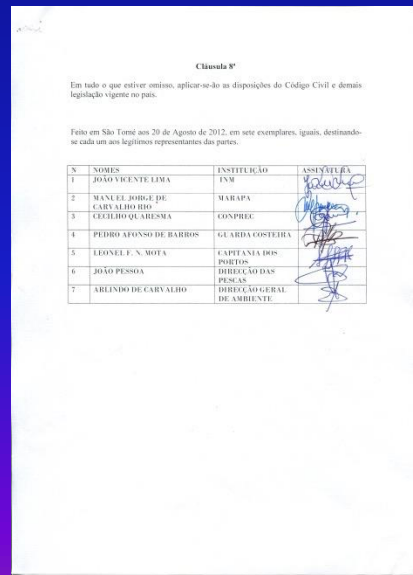
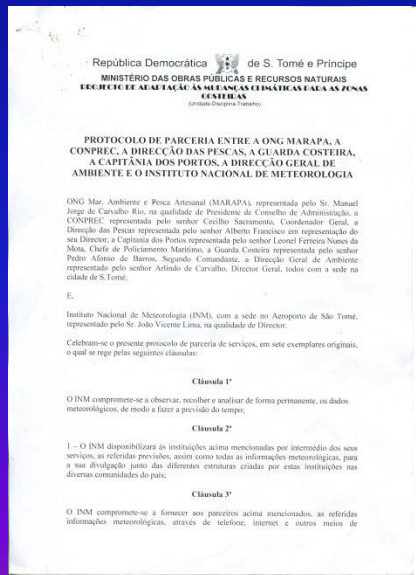
# Selected Results to Date (at 1.3 years of implementation)

## Early Warning System

**Expected Results (at end of project):** *At least 75% of fishers have access to 12 hour weather forecast during the fog/storm season*

### Results to Date:

**1. An Agreement Protocol for Early Warning specifying the roles of the different agencies was signed between Met Department, DG of Environment, CONPREC (Disaster Management Agency), Port Authority, Coast Guard and MARAPA**



*The protocol is very simple (3 pages) and took only a few weeks to finalize and sign*



# Selected Results to Date (at 1.3 years of implementation)

## Early Warning System

**Expected Results (at end of project):** *At least 75% of fishers have access to 12 hour weather forecast during the fog/storm season*



# **Selected Results to Date** (at 1.3 years of implementation)

## **Early Warning System**

### **Results to Date:**

- 1. An assessment mission in collaboration with UK-Met Department to assess viability and specifications for a potential Doppler radar*
- 1. Acquisition of a marine meteorological station*
- 2. All equipment is being assessed carefully to ensure sustainability*



# Component 1.2

## Safety at Sea for Artisanal Coastal Fishermen

### 1.1 Basic Safety at Sea equipment procured:

- 1.1 Radar reflectors for canoes
- 1.2 Life saving vests
- 1.3 Rain jackets
- 1.4. Waterproof bags for mobile phones
- 1.5 Basic navigation equipment



2. *MARAPA (Specialized NGO) about to start training in safety at sea for about 485 fishermen*

3. *Disaster Management Committee (CONPREC) formed 11 climate risk management committees in Sao Tome and 3 in Principe*

4. *Training of community committees is ongoing*

Contribuicao GEF:  
US\$0.33 M



# Component 1.2

## Examples of Immediate Results for Community Risk Management Committees

*Clogged canal (in Ribeira Afonso) has been cleaned voluntarily by the committee*



# Component 1.2

## Examples of Immediate Results for Community Risk Management Committees

*Very vulnerable households (photos right in Malanza and Praia Melao) threatened by the sea were identified and Government alerted to provide immediate help*



# Component 2:

## Coastal Protection for Vulnerable Communities

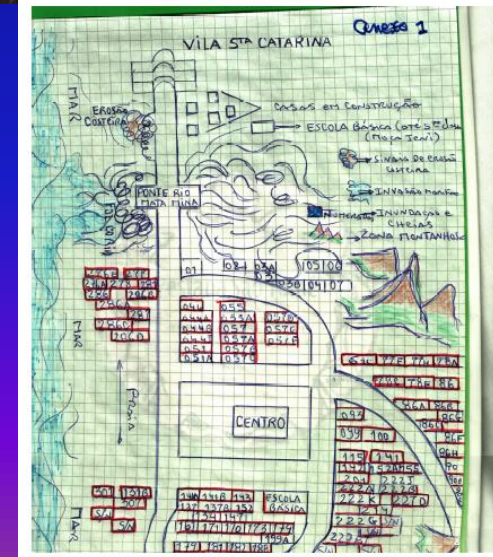
### Indicadors

*Participatory vulnerability plans developed and adopted*

*River and coastal flood protection works and soft adaptation measures*

*Number of community-based activities supported*

- 1. A detailed geomorphological and social study has been completed, identifying priority adaptation interventions*
- 2. A manual for community participation procedures is near completion*
- 3. Participatory vulnerability mapping is being completed*
- 4. Detailed engineering designs being done for structural works*



# Component 2:

## Coastal Protection for Vulnerable Communities

This component was complemented by a study comparing topographic maps from the 1950s with satellite maps from 1990, 2000 and high resolution imagery for 2011



Figure 4: Comparison of all input data at a scale of 1 : 2,000  
1: Topographic Map (scale 1:25,000); 2: SPOT-2 (resolution 10 m);  
3: SPOT-4 (resolution 5 m); 4: WorldView-1 (resolution 0.5 m)

*This study was funded in partnership between the European Space Agency and the Trust Fund for Environmentally Sustainable Development (World Bank)*

# Component 2:

## Coastal Protection for Vulnerable Communities

The maps show both the location of the original settlements vis-a-vis current roofprints (in red) as well as the changes in coastline from 1950s to 2011

High risk areas and climate change projections are being overlaid in the maps

*The maps allow communities, for example, to see areas of the coast that have been severely devegetated and need to be replanted*

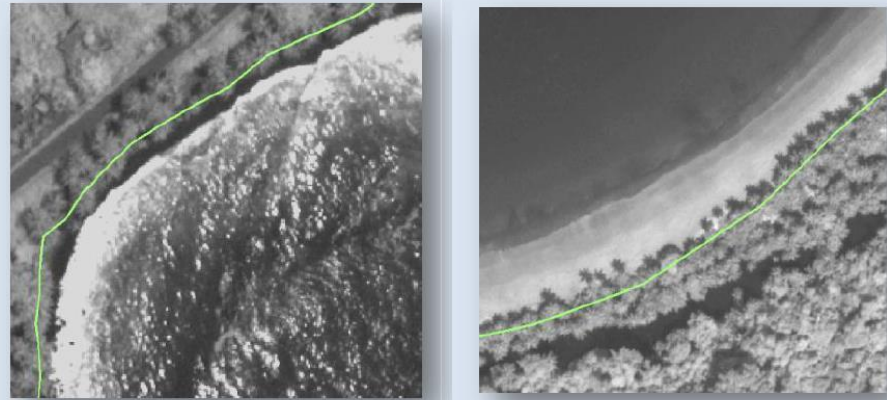


Figure 6: Delineation of the vegetation line

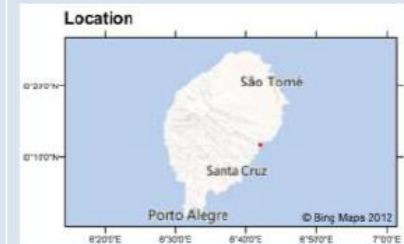
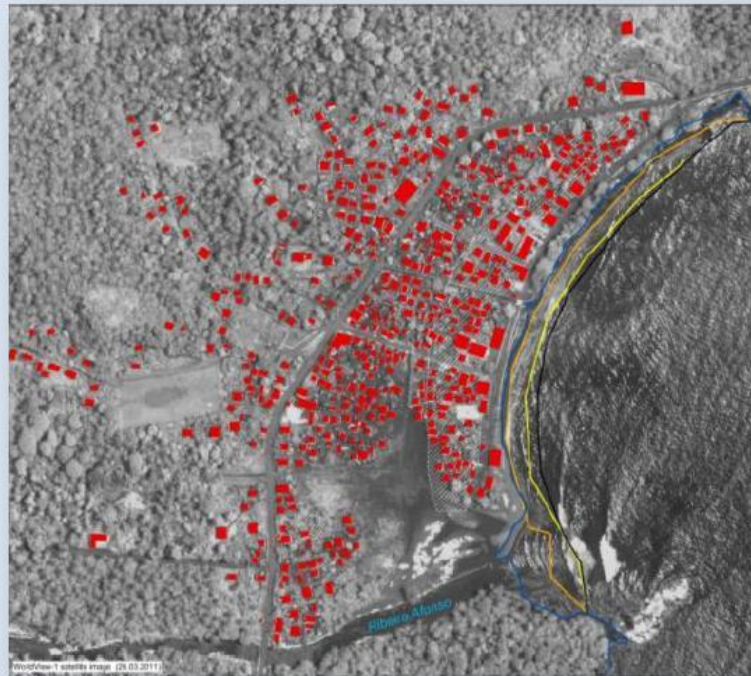


# Component 2:

## Roof Print Maps

The maps show both the location of the original settlements vis-a-vis current roofprints (in red) as well as the changes in coastline from 1950s to 2011

*This community for example, is growing in an unplanned manner. The government will need to settle economic infrastructure more strategically to attract settlements to lower-risk areas where services can be more efficient*



red point: location of Ribeira Afonso

### Legend

- Buildings 26.03.2011
- Area of Settlement 1958
- Shoreline 26.03.2011 - 10:20:32 UTC  
1 h after high tide (est. tidal height 1.42 m)  
(Source: WorldView-1 satellite image)
- Shoreline 05.07.2003 - 10:06:00 UTC  
2.5 h after high tide (est. tidal height 1.39 m)  
(Source: SPOT-5 satellite image)
- Shoreline 21.03.1990 - 10:04:00 UTC  
2 h before high tide (est. tidal height 1.27 m)  
(Source: SPOT-2 satellite image)
- Coastline 1958  
(Source: topographic map 1:25 000)

# Component 2:

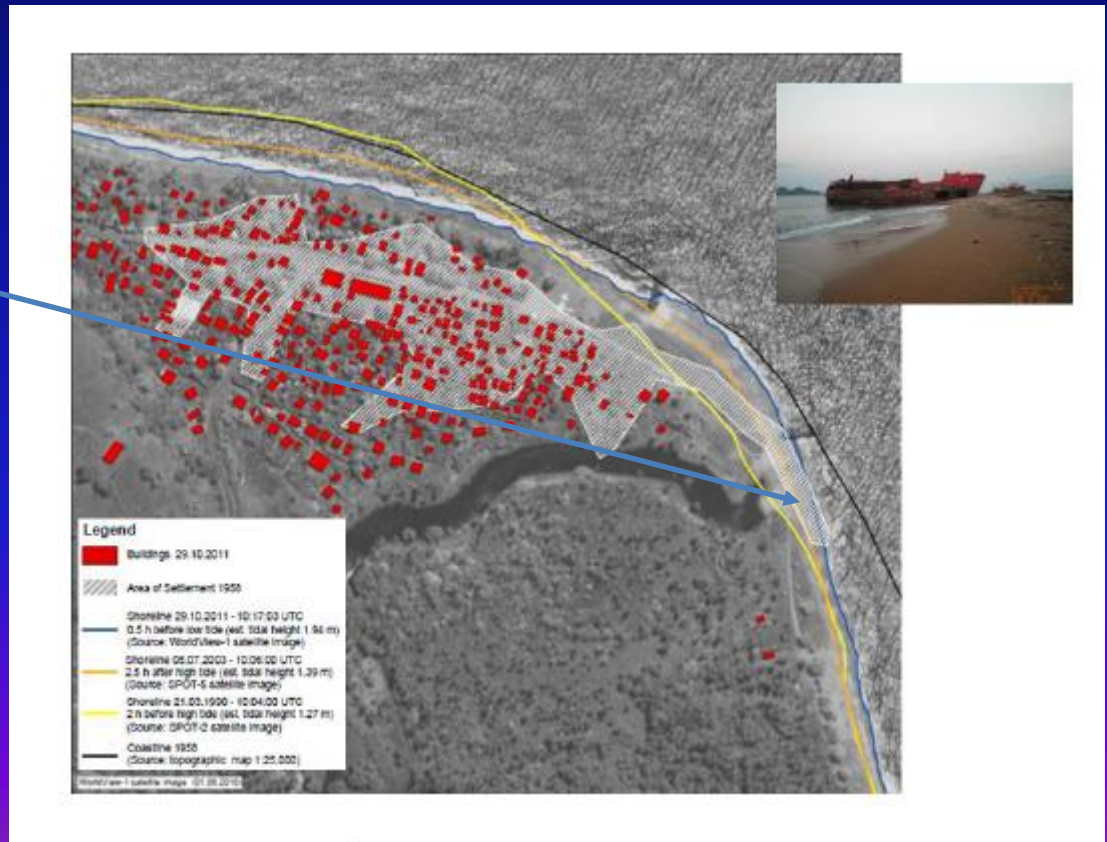
## Roof Print Maps (example 2)

The maps show both the location of the original settlements vis-a-vis current roofprints (in red) as well as the changes in coastline from 1950s to 2011

*This community has actually gained coastal land to the south ...*

*But only because there are two shipwrecks placed perpendicularly to the coast....*

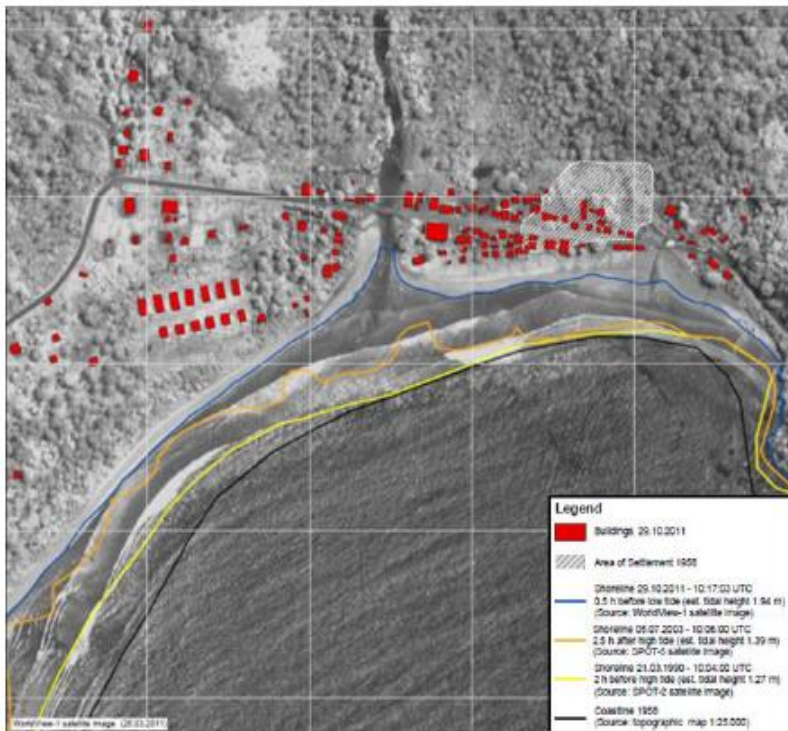
*This suggests that breakwaters located in the same way may help with coastal erosion*



# Component 2:

## Roof Print Maps (example 3)

This map shows a very significant coastline loss in Malanza (south of Sao Tome). The slope is very shallow and may be helped by revegetation and beach nourishment.



# Next Steps

- *Overlay projected future changes in coastline under sea level rise and future climate change*
  - *Continue participatory discussions with communities and local district governments to help plan better for the future*
  - *Implement pilot adaptation activities*
  - *Over the long term, government to place location of social and economic infrastructure in lower risk areas....*
  - *...thus gradually attracting settlement expansion away from areas of high risk...*
- This interactive, participatory planning is expected to lead to transformational adaptation**



# STP NAP

- Identify the areas and needs that require support to advance the NAP process in STP including through a stocktaking exercise with the involvement of all relevant key stakeholders;
- Guide on a stocktaking exercise of ongoing relevant projects/ programs active in STP in order to get a clear picture of the current baseline in terms of the institutional, technical and financial capacity needed to advance the NAP process;
- Summarize the key climate change vulnerabilities to be addressed based on the current studies including from the NAPA, and National Communications;
- Describe the proposed activities/ interventions needed to address the problem including the barriers to their implementation;
- Describe the additional cost reasoning including a clear description of what would happen with and without the project

# 1. Institutional, technical and financial capacity to advance the NAP process in STP

Strengthening the capacity within the GoSTP to prioritize and integrate climate change adaptation interventions in STP in the long term.

- Establish a National Coordination Mechanism (NCM) for the NAP process in STP.
- Revisions to the relevant policies, strategies and plans proposed to promote the integration of climate change adaptation in development planning in STP.
- Training provided to national stakeholders from finance, planning, and environment ministries on:
  - i) the NAP process; and
  - ii) recommended revisions to policies, strategies and plans to advance this process.

# 1. Institutional, technical and financial capacity to advance the NAP process in STP

## Strengthened Technical capacity of GoSTP to effectively design and implement context specific climate change adaptation interventions

- Provide training to the NIM to effectively collect, process and analyse climatic/weather data in STP in the medium and long term, to inform climate change adaptation.
  - Provide training and build capacity for stakeholders from the CNCC, OE, CIAT, national and local government, NGOs, CBOs, environmental journalist organisations and private sector on the effects of climate change in STP, best-practice adaptation techniques, adaptation priorities and the NAP process.
- Strengthening capacity to support the NAP process in addressing climate change in STP.

# 1. Institutional, technical and financial capacity to advance the NAP process in STP

Strengthening capacity to support the NAP process in addressing climate change in STP

- Undertaken assessment on the costs and benefits of implementing the revised policies, strategies and plans to meet STP's adaptation needs.

- Develop funding strategy to support the NAP process in STP in the medium and long term.



# On-the-ground demonstrations of adaptation technologies to combat coastal erosion and droughts.

- \* Implement technologies that reduce the vulnerability of local communities and build an evidence base to inform future adaptation investments in STP in priority areas.
  - Coastal erosion control interventions – including infrastructure
    - Identify and propose coastal development setback line along STP's coastline to limit the impacts of sea level rise on future coastal infrastructure and structures.
    - Implemented interventions to decrease the vulnerability of communities to more frequent and severe droughts in STP – including irrigation systems

# Knowledge and awareness of adaptation to climate change in STP

- \*Enhancing Knowledge and awareness of the effects of climate change in STP and best-practice adaptation techniques.
- Develop and institutionalize Long-Term Research Program (LTRP) to monitor the impact of all adaptation interventions implemented in STP in the long term and to inform future adaptation investments.
- Develop and implement campaign to raise awareness on the effects of climate change in STP and best-practice adaptation techniques.

# Monitoring, reviewing and knowledge sharing to learn from the NAP experience in STP

- \* Strengthening capacity to review, monitor and share knowledge on the NAP process and contributions to the NDC
  - Develop monitoring and evaluation system for the NAP process in STP.
  - Undertake training workshops with national, districtal and local government officials to implement the monitoring and reviewing system developed for the NAP process.
  - Develop and communicate a NAP Report to the GoSTP.

# STP NAP

- Establish and strengthening the institutional arrangements to lead, coordinate and support the integration of climate change adaptation into relevant policies, plans and associated processes*
- Develop and strengthening policies, plans and associated processes to identify, prioritize and integrate adaptation strategies and measures.*
- Improve scientific technical knowledge base for the identification, prioritization and implementation of adaptation strategies and measures.*

# STP NAP

-Adopt and scale up the *Climate resilient technologies and practices*

-*Increase awareness of climate change impacts, vulnerability and adaptation.*

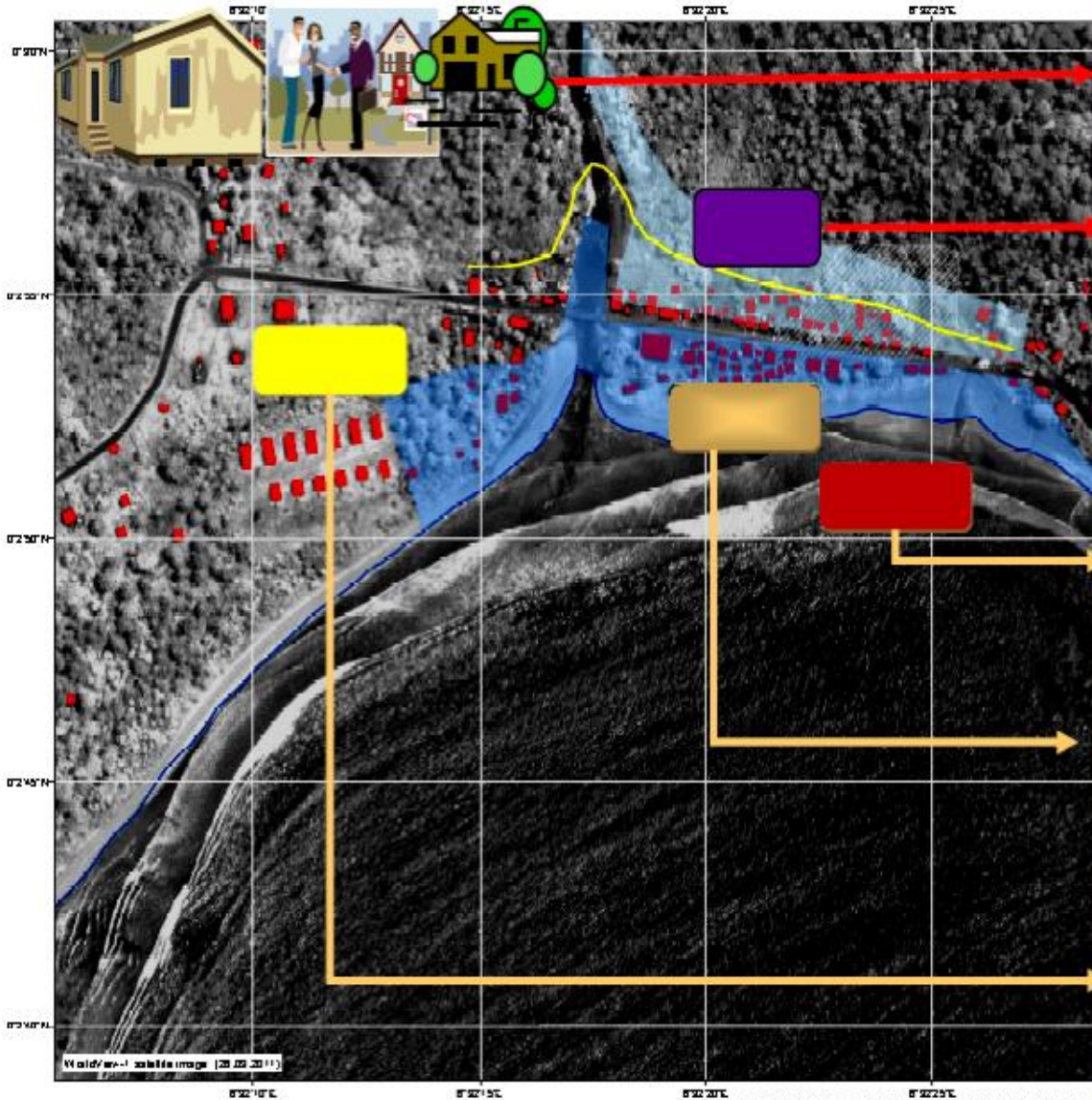
-*Strengthening the institutional and technical capacities and human skills to identify, prioritize, implement and monitor and evaluate adaptation*

# Ribeira Afonso



# Malanza

Roofprints of buildings, shoreline 2011, storm surge induced sea flood scenario and river inundation zone for Malanza, São Tomé



**ÁREA DE EXPANSÃO  
COMUNITÁRIA**



**ÁREA INUNDAVEL POR  
TRANSBORDO DO RIO**

**ÁREA DE RISCO POR  
EROSÃO COSTEIRA**

**ÁREA DE RISCO POR  
INVASÃO DO MAR**

**ÁREA DE RISCO POR  
IMPRESIBILIDADE DO  
SOLO (PANTANO)**









# Before and after

