Climate Change Adaptation Series: Document 11

VILLAGE VULNERABILITY ASSESSMENT AND CLIMATE CHANGE ADAPTATION PLANNING (V&A): SANGE VILLAGE, PANGANI DISTRICT, TANZANIA

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Prepared by the Pwani Project
in Partnership with the Pangani District Council

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1. Coastal and Marine Ecosystems in a Changing Climate: the Case of Tanzania.
2. Workshop Proceedings: Tanzania Coastal Climate Change National Adaptation Planning Workshop
3. Village Vulnerability Assessments and Climate Change Adaptation Planning (V & A): Kitonga, Bagamoyo District
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5. Rapid Assessment of Shoreline Characteristics and Dynamics of the Lazy Lagoon at Mlingotini Village, Bagamoyo
6. Livelihoods, Climate and Non-Climate Threats and Adaptation: Pangani District Coastal Villages
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Front cover: Simsim crops planted in Sange as a climate change adaptation following the V&A.

Photo Credit: Jairos Mahenge

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1. INTRODUCTION

There is now wide agreement by most scientists and climate change professionals that climate change and increased climate variability are already occurring and having serious consequences for many African countries, including Tanzania. The predictions from the experts on climate change are that the problems caused by climate changes will increase and make management of coastal ecosystems and improvements to community resilience even more difficult. The following threats are predicted to cause major problems for coastal resources and the well-being, safety, and food security of coastal communities:

1. More unpredictable precipitation (seasonality and intensity)
2. Increases in strong storms
3. Sea level rise
4. Increased sea surface and ambient air temperatures
5. Increased ocean acidification

These climate and chemical threats and the problems they create are on top of and in addition to existing local stresses. In most of coastal Tanzania, these include deforestation, over fishing, deterioration in water supply and quality, and development pressures.

Beginning in 2010, the Pwani Project initiated an effort to help local leaders and government to assess climate change impacts and find ways to adapt to current and future climate change impacts in a strategic way using their own resources and knowledge. This is part of a larger coastal management effort in a partnership with the government of Tanzania and the United States Agency for International Development (USAID). This Project has a geographic focus on the island of Unguja in Zanzibar and the ecologically important northern coast of mainland Tanzania – Bagamoyo and Pangani Districts. The overall goal is to help sustain the flow of environmental goods and services; revise the trend of environmental destruction of critical coastal habitats; and improve the wellbeing of coastal residents in the Bagamoyo-Pangani and Menai Bay Seascapes.

This report focuses on Sange village in Pangani District. Sange village is comprised of three sub-villages: Sange Kuu, Makolola and Sange Kijijini. It is a small farming village located in Mkwaja Ward. Sange Kijijini is the headquarters of the village. Sange Kuu is the oldest settlement, whereas Sange Kijijini and Makolola were established during the *Ujamaa* villagization scheme in 1974 when villagers were relocated from scattered homesteads to form *Ujamaa* villages. Sange has a population of 1,642 individuals living in 410 households. The village borders include Mikocheni village to the south, Kipumbwi village to the north, SANAPA to the west, and the Indian Ocean to the east.

The specific objectives of the Sange V&A include the following:

- To develop awareness and understanding of the concept of climate change
- To develop awareness and understanding of natural processes and anthropogenic causes of shoreline and ecosystem change
- To promote good practices of shore management and small-scale agriculture
- To identify doable climate change adaptation actions
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Definitions

Climate Change	A shift in weather averaged over decades or centuries due to natural variability or because of human activity
Vulnerability	The degree to which a human or natural system is susceptible to, or unable to cope with, adverse effects of climate change. Vulnerability is a function of the types and amount of assets at risk (exposure), the degree to which those assets and people are impacted (sensitivity), and the ability to cope with actual or expected changes (adaptive capacity).
(Planned) Adaptation	Is a process of deliberate decision making to take societal actions in response to actual or expected climatic changes or their impacts, so as to reduce harm or exploit beneficial opportunities
Exposure	Refers to assets (land, infrastructure, human society) at risk to the impact of climate change
Sensitivity	The degree to which assets are sensitive to incurring negative impacts from climate change and climate variability

2. METHODOLOGY

The V&A applied Participatory Rapid Appraisal (PRA) tools and used focus group techniques for obtaining information from the community. A full list of those who participated can be found in Appendix 1. One of the PRA tools used to gather information on different natural resources, forms of land use, and livelihoods and climate and non-climate stressors within the community was through a transect walk in the village (Photos 1 A and B). Semi-structured questions focused on observed climatic trends (e.g. seasonality, precipitation intensity and timing, and sea temperature), natural resource and other observed climate effects, non-climate pressures and impacts, and adaptive capacities. Four areas of adaptive capacity were evaluated with respect to the village and Pangani District:

- Coastal Resources Management
- Risk Awareness and Emergency Response
- Economy and Society
- Governance and Leadership

Photo 1. Transect walk along the beach (A) and mangrove areas (B).

Individual interviews were also held with key village leaders, elders, women and poor or otherwise marginalized individuals to get their views and perceptions so as to triangulate the information obtained. The V&A team included the Pangani District Climate Change Task Force. In the end, the project staff reviewed the findings together with the Pangani District Climate Change Task Force (Photo 3) and drafted an adaptation plan, which was later vetted with the village council.

Photo 2. Pwani / TCMP staff meeting with Pangani District Climate Change Task Force in Pangani District office

3. CLIMATE CHANGE TRENDS AND PROJECTIONS

The overall projections from climate models for coastal Tanzania are that surface water temperature and ambient air temperature will rise, sea level will rise (from the thermal expansion of the sea), the sea will become more acidic from carbon sequestered in the sea which then forms carbonic acid, and areas with bimodal rainfall patterns (as in Sange) will experience increased rainfall and less predictable seasonality and temporal distribution of precipitation. The results of these precipitation and seasonality changes are both flooding and droughts.

From this starting point, the village level V&A sought to overlay local knowledge on climate trends that are beginning to show themselves in the village and to plan accordingly. For example, local knowledge can help answer the basic question: "Has the frequency, magnitude, or timing of precipitation, flooding, or drought events changed in the last several decades?" By integrating best available scientific data with local knowledge, communities and government can take responsible action even in situations where there is imperfect climate change information.

Current climate variability, such as the major droughts of 2005/6 and the major floods of 1997/8, has significant economic costs in Tanzania.

These periodic extreme events cause major macro-economic costs, reduce economic growth and affect livelihoods: the 2005/6 drought affected millions of people and had estimated costs of at least 1% of GDP.

These events also reduce long-term growth and development and it is clear that Tanzania is not adequately adapted to deal with existing climate risks.

Models indicate that climate change could lead to net economic costs that are equivalent to a loss of almost 2% of GDP each year by 2030 in Tanzania.

Source: we adapat.org (2011)

4. OBSERVED CLIMATE AND NON-CLIMATE THREATS AND IMPACTS

The participatory rapid appraisal and semi structured interviews identified climate and non-climate threats experienced by those living in the Sange village (Table 1). The climate change committee members reported that in the past, the village was well known for its fishery resources but due to the very poor condition fisheries resources, reduced stock abundance, and pressure of fishers from nearby villages, many residents of Sange village no longer fish for a livelihood and depend instead for their subsistence on agriculture and household livestock keeping (e.g. poultry). The loss of a healthy fishery threatens food security at a time when the village population continues to grow.

Table 1. Climate and Non Climate Threats Identified in the Sange Village

Threats	Impacts
Climate related threats	
Severe droughts	Reduced agricultural productivity
Rainfall less distributed over time in the long and short rains	Reduced crop diversity, lack of reliable water source for irrigation
Coastal erosion	Destruction of coconut farms and beach front infrastructure
Changes in water flow of the Msangazi River	Periodic flooding and saltwater intrusion
Other threats	
Reduced fish abundance	Loss of income and reduced food security
Population growth	Pressure on natural resources
Invasion of pastoralists on farmlands	Reduced farmland
Destruction of crops by wild animals from SANAPA	Reduced harvests

Agriculture faces its own threats. Stress to agriculture includes several severe droughts in the recent to medium-term past that could be climate change related. Decreased rainfall (or rainfall that is increasingly less distributed over time in the long and short rainy seasons) possibly from climate change also affects agricultural production. The village has a fertile small valley[1] that previously produced a variety of vegetables and paddy rice. Decreased rainfall has shrunk crop diversity and only paddy rice can be grown in the area now. Furthermore, the community does not have a reliable source of water and therefore cannot irrigate. Other non-climate stressors to agriculture as a livelihood include invasion of pastoralists from the uplands and destruction of crops caused by wild animals (the village borders on Saadani National Park).

Being dependent on rain fed agriculture, and with the current rainfall patterns changing, the rural community is very exposed, sensitive, and vulnerable to the impacts of climate change. Rural fishing and agricultural communities already suffer from poor fish storage facilities, poor transportation and market chains, and little extension service.

Another environmental change is coastal erosion. The erosion is so significant that several acres of coconut farms have been lost in the recent past. Also, a large rock[2] in

[1] The valley is locally known as Msangazi valley originating from the nearby Msangazi river

[2] The rock is locally known as “Jiwe la Sange”

the intertidal area, which was previously surrounded by land, is used by the villagers as a benchmark to monitor erosion and loss of land. The erosion is likely largely caused by caused by shorefront development of beach hotels and removal of shoreline vegetation. Tourist hotels located in Sange clear beach *Ipomea* grass species for the purpose of obtaining clear, sandy beaches.

Sea level rise and heightened wave action from increased winds undoubtedly exacerbates the other natural and anthropogenic causes of erosion. Continuing erosion threatens all types of shoreline natural and human assets, including endangered sea turtle nesting sites.

The Msangazi River has experienced saline water intrusion, widening of the river banks due to abnormal flooding and decreased water depth due to increased siltation caused by erosion from upstream areas.

The climate and non-climate threats identified by the climate change committee and Pangani District Climate Change Task force during the participatory rapid appraisal were presented to the Sange community during a feedback meeting.

Photo 3. Pangani District Climate Change Task Force Member delivering feedback of climate change vulnerability assessment results to members of the Sange village.

5. ADAPTIVE CAPACITY

Adaptive capacity was measured through a survey completed during a work session with the Climate Change Committee. The survey measured the Sange village's adaptive capacity within four areas: economy and society; coastal resources management; community risk awareness and emergency response; and governance and leadership. Tables 2 to 5 shows the scores given by the committee members for each of the areas measured. Each section or subsection began with an overview question (in bold) followed by a number of sub-questions. Furthermore, the questions asked had a five point scale of zero to four points. For example, for the first question: "*Do people earn their livelihood mainly doing the same thing all the time or does the community have a range of income sources and options, and individuals participate in several of these"*, the scoring choices were: *No livelihoods (0) one livelihood (1) up to three livelihoods (2) up to 5 livelihoods (3) over five livelihoods (4).* The complete survey with all scoring choices can be found in Appendix 2.

Table 2. Scoring summary for the theme economy and society

Theme: Economy and Society	**Score**
Economy and society (overview)	**1**
Do people earn their livelihood mainly doing the same thing all the time or does the community have a range of income sources and options, and individuals participate in several of these?	2
Are the main livelihoods in the village at risk from natural, social or economic hazards and change?	1
How is the status of the village economy evolving?	1
Does the community believe it has the capacity to move its economy forward in a positive direction?	1
Have supplementary or alternate livelihoods been identified that can make a difference for individuals or the community as a whole?	1
Are livelihoods dependent on outside market forces in a given year?	2
Attention to marginalized communities (overview)	**2**
Does the community do a good job in taking care of the needs of disadvantaged groups?	2
Total score:	**13 (out of a maximum of 36 points)**

As shown in table 2, the **economy** of Sange is weak due to limited and vulnerable livelihood opportunities and poverty—although most people have more than one livelihood, which increase their resilience. The community depends mainly on agriculture, subsistence chicken raring, fisheries and petty business. There are also opportunities in salt making and timber trees planting. The beach tourism sector, which is expanding rapidly in nearby villages, provides little benefit for those living in Sange, and may be the source of worsening conditions of beach erosion and well water extraction. The Sange village is progressive in taking care of the needs of disadvantaged group. Through its Village Leadership Coalition, the village supports HIV/AIDS vulnerable groups (people living with AIDS, orphans, widows) and other disadvantaged groups, by helping them access community based savings and credit schemes and other services.

Table 3. Scoring summary for the theme Coastal Resource Management and Land Use Planning

Theme: Coastal Resource Management and Land Use	Score
Condition of coastal resources (overview)	**1**
What shape are your coastal resources in?	1
Land Use Decision Making and Planning (overview)	Not scored
Is the way land is allocated for use deemed fair and adequate for community needs?	1
Is infrastructure development being done in a wise and thoughtful manner, using traditional understanding of how coastal resources behave?	0
Does the community get all of the infrastructure that it needs to insure the safety and well-being of its citizens?	1
To what extent has the community taken the initiative to address its coastal issues and to plan for future uses?	1
How well can the community mobilize to put a plan into action related to the use of its coastal resources?	1
TOTAL	**6 (out of a maximum of 28 points)**

The **Coastal Resource Management** capacity in Sange is weak (Table 3). The villagers perceive that the coastal resources are in fair condition. The village has been exposed to some coastal resources management initiative, including a collaborative fisheries management project that ended almost ten years ago. Other examples of experience and awareness are a turtle conservation program that the village is involved in, and a successful mangrove replanting initiative that targeted previously bare mangrove salt flat areas.

There is some **Land Use Planning** in the village, which falls under the District Land Use Plan. The Plan helps control the pastoralist migration and attempts to illegally occupy land for pasture for livestock. The village government has led some initial land use planning, but does not have an approved Land Use Plan. Even without a Plan, the village authorities have the jurisdiction to allocate and manage land within Village boundaries. The largest weakness related to land use planning is uncontrolled infrastructure and other development. For example, in some areas public access to the shore has been curtailed as some guest lodge operators are building directly on the dunes—exacerbating shoreline erosion. Decisions are not done in a wise and thoughtful manner, using traditional understanding of how coastal resources behave.

Table 4. Scoring summary for the theme Risk Awareness and Emergency Response

Theme: Risk Awareness and Emergence Response	Score
Public awareness of local conditions such as erosion, shifting of rivers course /delta (overview)	0
What are the main causes of these problems?	1
What formal or informal education programs exist in this community to promote risk knowledge and help with adaptation	0
What are some of the steps the community is taking to reduce the impacts of the risks	0
Emergence response (overview)	**1**
Do people get enough information in time to react to a local emergency?	2
As far as you can remember, how often has the community mobilized resources to address emergency situations?	1
Are there any formal/informal groups that help out during emergency situations?	1
When there are emergencies or problems that affect people and create sudden hardship, how well does the community do in taking care of these cases?	1
Is there enough training that help the community handle emergency situations?	0
Total Score	**7 (out of a maximum of 40 points)**

The climate change committee perceived that the public is unaware of the causes of erosion and other local conditions. However, the committee itself was able to name the probable causes of a few threats (Table 4). The climate change committee maintained that when a local emergency, such as a drought, is about to occur, the community usually knows in advance what is happening and have time to prepare. There is an institutional structure but little or no experience related to Community Risk Awareness and Emergency Response. Sange has a village Disaster Management Committee comprised of the heads of hamlets, religious leaders, traditional leaders, and civic organizations. The Village Chairperson chairs the Committee and the Secretary is the Village Executive Officer. There is also a "basket fund" to provide assistance to the most vulnerable and marginalize groups in the event of a disaster. Despite the Disaster Management Committee, there is very low awareness of risks and emergency preparedness and response in the community.

Table 5. Scoring summary for the theme Leadership and Local Organization

Theme: Leadership and Local Organization	Score
Leadership and local organization (overview)	**3**
Does the local village government discuss issues with the entire community?	2
GL 2. Do Assembly representatives communicate with the community?	1
How well do village committees function?	1
Security, law, and order (overview)	**4**
How safe do people feel who live in the village?	4
Is it true that most community members comply with local and national government laws?	3
Is it true that most community members go along with social norms of the village?	3
Local leaders insure that there is good enforcement of laws	4
Local leaders make sure that social norms are followed	3
How much reliance is made on outside sources of help for maintaining security	4
Total score	**32 (out of a maximum of 45 points)**

Village **Governance and Leadership** are perceived to be strong in Sange (Table 5), which won the best Village Multisectoral AIDS Committee competition in the Pangani District in 2012. A village assembly is held quarterly to address different community issues. Village leaders take charge in the case of non-compliance of village by-laws and regulations. Village issues that can't be resolved are brought to the District to be addressed. The District has a special desk for solving village problems. The desk is responsible for addressing the problems at the District level and providing feedback to the Village Council.

In the Sange village, **women** are actively involved and participate in existing local institutions and committees. Following this trend, women have joined the climate change adaptation committee and work with the group to demonstrate doable adaptation actions for the rest of the village.

Figure 1 sum up the adaptive capacity scores for the Sange village. It shows that the village's greatest strength is its strong leadership and organization. This is something that the village can build on as it strengthens its adaptive capacity in the areas that are lagging behind—especially coastal resources management and risk awareness and emergence response.

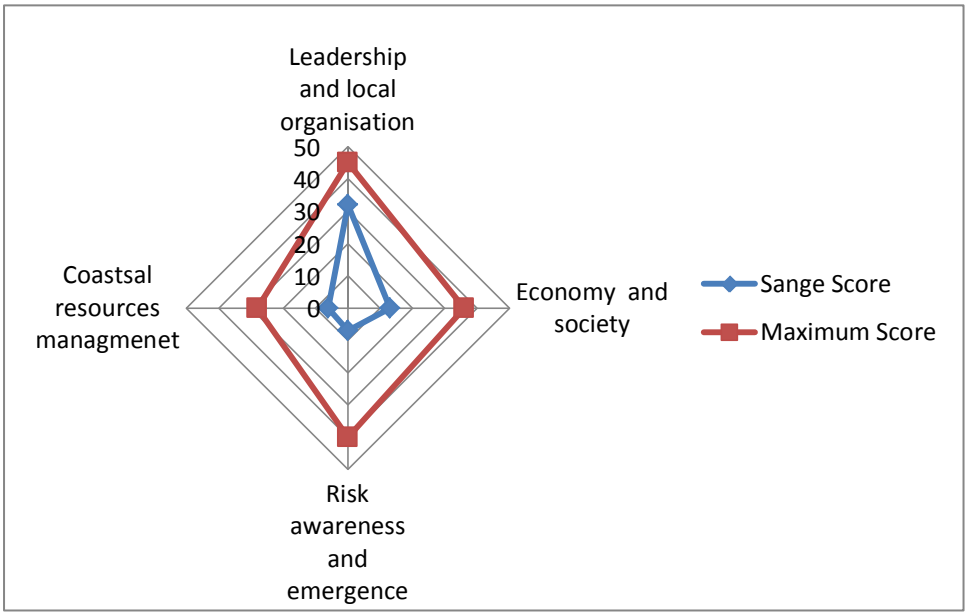

Figure 1. Summary of Adaptive Capacity for the Sange Village

6. ADAPTATION ACTIONS

Community members from different representative groups gathered to identify doable adaptation actions in the village. The stakeholder groups included members from livelihood groups (agriculture, fishing and petty trade) and the climate change committee. Ideas focused on restoration of habitat (planning of beach vegetation, mangroves, and *trees*), natural resource based enterprise (cash crops such as simsim, sunflower and fruit trees, and animal husbandry), and environmental awareness efforts (on beach erosion and natural hazards).

These ideas were translated into an action plan roadmap for follow-up actions (Table 6). The village Climate Change Committee is taking the responsibility for implementing the planned activities under the supervision of the Village Council.

Objective	Activities	Responsible
1. Improved coastal resources management	i. Mangrove replanting ii. Planting ipomea along the beach iii. Planting "mikadi" iv. To sensitize investors to plant trees within 60 meters v. Conduct land and sea patrols to combat environmental degradation and illegal fishing.	Climate change committee Community Investors Village Government District Council
2. Improve understanding on disasters and emergency responsiveness	i. To create disaster awareness and how to manage: (a) Climate change committee (b) Disaster committee (c) Community (ii) To provide disaster information to the community iii. To support community members impacted with any disaster	Climate change committee Village government Community District Council Projects and donors
3. Improved Socio-economic activities	i. To collect data on available trees per household ii. Establish beneficial trees nursery iii. Promote tree planting at house hold (50 for timber, 5 for shading and 10 for fruits) iv. Planting drought resistant crops e.g. simsim, sun flower, legumes.	Climate change committee TANAPA/SANAPA Community District Council Other donors and projects

Objective	Activities	Responsible
	v. Provide training on entrepreneurship skills to villagers vi. Promote animal husbandry vii. Establish water catchment at Msangazi river valley for rice cultivation	
4. Improved governance and leadership	i. Conduct training on leadership and good governance to climate change committee and village council.	Climate change committee Village Council District Council NGOs and projects

For **beach vegetation**, there was agreement on the importance of planting *Ipomea* along the beach both in front of hotel properties (combined with environmental education on beach erosion) and along the shore of the community. *Ipomea* plays an important role in beach accretion by reducing the strength of backwash of wave action. A further action considered is to conduct a peer-to-peer learning exchange and study tour of Paje and Jambiani where *Ipomea* beach planting is also being applied as an erosion adaptation action with the technical assistance of the Institute of Marine Science.

Planting of appropriate timber, shade and fruit tree species has multiple benefits, such as reducing erosion and run off from heavy rain events, providing shade, providing a future source of wood for cooking and timber, and a source of income and fresh fruit for fruit trees.

Simsim (sesame): This is a drought and disease resistant crop. It is also early maturing and the market for simsim is good in the Pangani area. It is grown in Sange, but it is grown without understanding of best agricultural practices (such as spacing) and improved variety. The village Agricultural Extension Officer in this village makes promising to simsim agricultural practice the best future alternative in enhancing village livelihood and economy

Disaster management: The existing mechanisms for disaster management are inadequate. The village Climate Change Committee asked for assistance through the District Disaster Management Committee.

Photo 3. Sange Climate Change Committee members preparing their adaptation plan

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Appendix 1. List of participants in the climate change vulnerability assessment and adaptation planning

No.	NAME	TITLE/REPRESENTATION
1	Josephina Maiko	Member, Climate Change Committee
2	Wiliamu J. Pendeza	Member, Village Council
3	Mohamedi Hoseni	Member, Village Council
4	Selemani Hamisi	Member, Village Council
5	Donald Michael Gomole	Member, Village Council
6	Mahamudu Jumaa	Member, Village Council
7	Awadhi Ally	Member, Village Council
8	Petro Jakobo	Member, Village Council
9	Mgaya Rajabu	Member, Village Council
10	Yahaya A. Chamia	Member, Village Council
11	Saidi Rajabu Mahoja	Sub-village Secretary
12	Kibwana Mgaza	Member, Climate Change Committee
13	Mwanaidi Kasim	Member, Climate Change Committee
14	Hariri Husseni	Member, Village Council
15	Rehema Ally	Member, Climate Change Committee
16	Amina Alfani	Member, Climate Change Committee
17	Asha A. Makwero	Member, Village Council
18	Mwajabu Omary	Nurse
19	Mgeni Hosseni	Member, Village Council
20	Tatu Abedi	Member, Climate Change Committee
21	Ismail J. Kallima	Member, Village Council
22	Juma Ali Sele	Member, Climate Change Committee
23	Imani A. Dikwanga	Member, Village Council
24	Mbaruku Hamisi	Member, Village Council
25	Masimbu Bai	Member, Village Council
26	Mwajuma Rajabu	Member, Village Council
27	Makombo Ramadhani	Member, Village Council
28	Loida A. Pangani	Member, Village Council
29	Ashiruna Ramadhani	Member, Climate Change Committee
30	Dauni M. Msagati	Primary School Teacher
31	Suphiani Zuberi	Member, Village Council
32	Joseph Donald	Member, Climate Change Committee
33	Abushiri Amrani	Member, Climate Change Committee
34	Ediko Wiliamu	Member, Village Council
35	Juma Kahamba	Village Agricultural Officer
36	Jumaa M. Ally	Village Chairperson
37	Machumvi Maungu	Member, Village Council
38	Rubeni E. Kiyombo	Member, Climate Change Committee

Appendix 2. Detailed Assessment of Climate change Vulnerability and Resilience in Coastal Communities

Focus Group Questionnaire

GROUP MEMBER COMPONENT……

NUMBER OF MEMBERS……

FOCUS GROUP INTERVIEW FACILITATOR……..

Thematic Areas:

Governance and Leadership
Coastal Resources Management
Risk Awareness and Emergency Response
Economy and Society

Theme 1: Governance and Leadership (GL)

Governance is a very broad indicator that measures a variety of characteristics that together indicate how process and decisions are made to serve the best interests of the community and stakeholders. We focus here on leadership and stakeholder participation in management and decision -making. (Source: SocM Pasifika 2011)

Good governance is about achieving desired results and achieving them in the right way, in compliance with laws and policies and shaped by cultural norms and values of an institution, organization, or community. Governance provides the enabling conditions for coastal communities to absorb or resist perturbations, bounce back from disturbances, and adapt to change. (Source: Resilient Community Thailand 2007) Leadership measures the presence of community leaders or government officials who can mobilize climate change responses and resources to support adaptation, and their effectiveness or credibility. This indicator is important because communities with strong, trustworthy, effective leaders will be more able to adapt. Stakeholder participation in management and decision-making is critical to buy-in of any new program related to climate change. (Source: SocMon and SEM-Pasifika 2011).

The overall measure of governance and leadership is a combination of two themes of 1) leadership and local organization and 2) security and law and order. The score for each theme could be the aggregate of all of the indicators/questions under each theme. The overall score for this area could be the aggregate of the themes or a modification thereof justified by discussion notes.

Topic 1: Leadership and local organization

Absent (0); Exists but weak (1); Exists but fairly strong (2); Exists and strong (3); Exists and very strong (4)

Introductory Question: What major leadership problems do you have in the community? When there is a problem in the community, whom do you count on to charge and lead to find a solution? Who are the key leaders in your village?	
Notes and comments	
Question or indicator	Coding scheme for responses
GL-1 Do the local village government discusses issues with the entire community? (This is a rating based on direct questions as well as how the traditional authority is referred to in discussions)	Never (0); Very rarely (1); Sometimes(2); Many times (3); all of the time (4)
GL-1 Notes and comments	
GL-2 Do Assembly representatives communicate with the community? (***How does the Assembly representative communicate with the village?*** Open ended responses might be a range from—we never hear from him/her; only tells his/her friends; comes to meetings regularly; initiates meetings when something important is happening)	Never (0); Very rarely (1); Sometimes(2); Many times (3); all of the time (4) To note if communications is perceived to be one-way or two-way?
GL 2 Notes and comments	
GL-3 How many committees does the village government have?	
How do they function (0)Not function (1)Poorly functioning (2)Fair functioning (3)Good (4)Very good	

Topic 2: Security, law and order

Unsafe and no compliance with laws/norms (0) somewhat safe but little compliance with laws/norms (1) safe but little compliance with laws/norms (2) very safe but little compliance with laws/norms (3) somewhat safe but average compliance with laws/norms (4) very safe and total compliance with laws/norms (5)

Introductory questions: 1) What are the security problems in the village? 2) What kinds of laws and local rules or norms are most frequently broken in the village?	
Notes and comments	
Question or indicator	Coding scheme for responses
GL-4 How safe do people feel who live in the village?	No security (0); Very unsafe (1); Somewhat safe (2) Most of the time feel safe (3); Always feel safe (4)
GL 4 Notes and comments	
GL-5 Is it true that most community members comply with local and	Never (0) , very little compliance – (1); average compliance (3) almost 100 % compliance (3); 100%

national government laws? (needs to be couched to simpler conventional laws on resource use)	compliance (4)
GL 5 Notes and comments	
GL-6 Is it true that most community members go along with social norms of the village? (simple social norms/customs/taboos on possible resource use)	Never (0) , very little compliance – (1); average compliance (3) almost 100 % compliance (3); 100% compliance (4)
GL 6 Notes and comments (list social norms)	
GL-7 Local leaders insure that there is good enforcement of laws (What usually happens when someone breaks a law? How often do you need outside help to deal with these problems?)	Never (0) less often (1); often (2) very often (3) Always (4)
GL 7 Notes and comments	
GL 8 Local leaders make sure that social norms are followed (What usually happens when someone is violating important norms?)	Never (0) less often (1); often (2) very often (3) Always (4)
GL 8 Notes and comments	
GL 9 How much reliance is made on outside sources of help for maintaining security (What usually happens when someone is violating important norms?)	No reliance (0) , very little reliance (1); average reliance (3) almost 100 % reliance (3); 100% reliance (4)
GL 9 Notes and comments	

Theme 2: Coastal Resource Management (CRM)

Topic 1: Condition of coastal resources

Poor (0); Fair (1); Good (2) Very Good (3) Excellent (4)

Question or indicator	
Introductory question: What are the main coastal resources that the community has? (map the coastal resources with community people)	
Notes and comments	

Question or indicator	Coding scheme for responses
CRM 1: What shape are your coastal resources in?	Poor (0); Fair (1) Good (2) Very good (3) Excellent (4)
CRM 1 Notes and comments	
CRM 2: What are the ways in which coastal resources are kept in good shape so they can be available to your children? (List the ways that seem to work well to keep coastal resources in good shape. What are the traditional ways that the village has managed its resources? What are the new ways that villages can utilize to manage their resources?)	
CRM 2 Notes and comments	

Topic 2: Land Use Decision Making and Planning

Poor (0); Fair (1); Good (2); Very Good (3) Excellent (4)

Introductory Question What are the processes for land acquisition in this community? What is the land ownership regime?	
CRM 3: Is the way land is allocated for use deemed fair and adequate for community needs? Is there an equitable distribution of access to resources and opportunities?	Coding scheme for responses Unfair (0); Somewhat fair (1); Fair and adequate (2); Most of the time is adequate (3) All the time is adequate (4)
CRM 3 Notes and comments	
CRM 4: Is infrastructure development being done in a wise and thoughtful manner, using traditional understanding of how coastal resources behave?	Never (0); Rarely projects seem to have many problems (1) sometimes projects have problems (2) most of the time projects are built and located correctly (3) All the time projects are built and located correctly (4)
CRM 4 Notes and comments	
CRM 5: Does the community get all of the infrastructure that it needs to insure the safety and well-being of its citizens?	Almost never (0); rarely projects seem to deliver benefits to village (1) sometimes projects deliver benefits to the village (2); most of the time we get the projects that we need (3) All the time we get projects we need (4)
CRM 5 Notes and comments	
CRM 6: To what extent has the community taken the initiative to address its coastal issues and to plan for future uses?	No initiative (0); initiated something but failed (1); there are a few good examples but no plan (2) the community is working on a plan (3) the community has adopted and is implementing a plan (4)
CRM 6 Notes and comments	
CRM 7: How well can the community mobilize to put a plan into action related to the use of its coastal resources? (What are some examples of how the village is dealing with any problems in using coastal resources?)	Never discussed (0); discussion but noting happens (1) discussion with limited action (2) discussion with more action (3) discussion with implementation (4)
CRM 7 Notes and comments	

Theme 3: Risk Awareness and Emergency Response (RA)

Awareness of household vulnerability of climate hazards measures a household's knowledge of susceptibility to climate hazards and its ability to cope with, recover from, or adapt to those hazards. Climate hazards are climate-related events that have the potential to cause harm. Households may be at risk for different types. Some may be transient—characterized by rapid onset and identifiable termination (such as a storm, flood, or drought). Others may result from a longer-term change in climatic variables (such as temperature or precipitation), be gradual, or result in related events such as sea level rise, mass coral bleaching, or ocean acidification. It is important to keep in mind that different households in the same community may experience each of the factors at a different level, and thus have different levels of awareness about their vulnerability to the same types of hazard. Access to and use of climate-related knowledge measures household access to different sources of information related to climate change, climate variability, and its impacts, and how this information is used. It

also includes access to any type of early warning system and can include past experience, traditional or local knowledge of climate patterns and events, as well as other sources of education, media, and communications. (Source: SocMon and SEM-Pasifika 2011)

The ability of a community to reorganize refers to the degree to which it is able collectively to learn, plan, and make necessary changes to cope with climate -related impacts in such a way that the main functions of the community are sustained. This may require restructuring organizations, changing plans, shifting priorities, adjusting roles, carrying out activities in a different way, or applying lessons from the past to better face a climate hazard. Degree of community reorganization is a critical indicator of resilience to changing climate. Level of community reorganization is a function of factors including cooperation and collaboration among community members, planning for climate change, level of collectivism in the culture, community leadership, shared goals and responsibilities, and access to and support from other sources in reorganization. (Source: SocMon and SEM-Pasifika 2011)

Topic 1: Public awareness of local conditions such as erosion, shifting or river course/delta

Unaware (0); low level of awareness (1) average level of awareness (2) high level of awareness (3) very high level of awareness (4)

Introductory question: What are the main natural and environmental threats that the community faces? *Rainstorm; Storm surge; Sea level rise Coastal/beach erosion; Saltwater intrusion into gardens/fields/water sources; Changes in rainy and dry seasons, leading to changes in planting seasons, etc.; Drought; Flood; Climate -related Bush fire caused by heat and dryness; Hotter climate; cholera; malaria; diarrhea outbreaks; agro- pests; soil fertility; famine*
Notes and comments

Question or indicator	Coding scheme for responses
RA 1: What are the main causes of these problems?	No ideas (0); Causes named for a few threats (1); Causes named for several threats (2) good ideas about the causes of most threats (3) good ideas of listed threats (4)
RA 1 Notes and comments	
Question or indicator	Coding scheme for responses
RA 2 What formal or informal education programs exist in this community to promote risk knowledge and help with adaptation *(List the educational programmes)*	None (0) very few (1) several but informal (2) several and more formal (3) educational programmes for all risks (4)
RA 2 Notes and comments	
RA 3 What are some of the steps the community is taking to reduce the impacts of the risks (Recall a risk that was mentioned and ask whether some kind of action is being considered or has been taken)	We aren't doing anything (0) one or two projects (1) several actions with limited impacts(2) several actions with positive impacts (3) actions for all risks with positive impacts (4)
What is the level of involvement of the community in these projects? (Probe what exactly has been done? Who is doing the project? How is the community involved)?	Not involved (0); involved at few stages (1); involved at many stages (2) involved at most stages (3) involved at all stages of project (3)

Topic 2: Emergency Preparedness

Unprepared (0); somewhat prepared (1) prepared (2) well prepared (4) very well prepared

Introductory question: What kind of social or economic emergencies happen in the village? List the kinds of emergencies. How do community people get emergency information? List the ways people receive information. Try to rank order the most important sources.	
Notes and comments	
Question or indicator	Coding scheme for responses
RA 7 Do people get enough information in time to react to a local emergency?	No one tells us what is going on (0) Most of the time we don't hear anything (1) Once in a while we get an alert or warning (2) We usually know in advance what is happening (3) we are always informed in advance
RA 7 Notes and comments	
RA 8 As far as you can remember, how often has the community mobilized resources to address emergency situations?	Never (0); one time (1) a few times (2) most cases (3) all cases (4)
RA 8 Notes and comments	
RA 9 Are there any formal/informal groups that help out during emergency situations?	None (0) few but non-functional (1) several but semi-functional (2) several but functional (3) enough and functional (4)
RA 9 Notes and comments	
RA 10 When there are emergencies or problems that affect people and create sudden hardship, how well does the community do in taking care of these cases? (*Example; family house burns down or destroyed by flood)*	Nothing happens and no support (0) seek outside help – eg. from NADMO, church etc (1)sometimes we are able to respond effectively (2) there have been numerous times when we took care of things ourselves (3) we always handle things ourselves (4)
RA 10 Notes and comments	
RA 11 Is there enough training that help the community handle emergency situations?	No one has received any training (0) a few times someone attended a training (1) there have been several trainings but capacity remains low(2) several trainings and capacity is growing (3) we are well prepared (4)
RA 11 Notes and comments	

Theme 4: Economy and Society (ES)

Changes in the economy and people's quality of life are often the main criteria upon which a community's resilience is judged after a disaster. The strength of the economy and the diversity of livelihoods greatly influence the community's ability to prepare for disasters, quicken the recovery process, and adapt to changes that make them less vulnerable in the future. Despite changes in coastal ecology, health, laws, governance frameworks, or hazard response programs, it is the improvement or decline in a person's livelihood that directly affects resilience. (Source: Resilient Community Thailand 2007)

Topic 1: Livelihoods and rural economy

seriously declining (0) getting worse over time (1) about the same as a few years ago (2) improving (3) prosperous (4)

Introductory question: what are the main ways people in the village earn their livelihood?	
Notes and comments	
Question or indicator	Coding scheme for responses
ES 1 Do people earn their livelihood mainly doing the same thing all the time or does the community have a range of income sources and options, and individuals participate in several of these?	No livelihoods (0) one livelihood (1) up to three livelihoods (2) up to 5 livelihoods (3) over five livelihoods (4)
ES 1 Notes and comments	
ES 2 Are the main livelihoods in the village at risk from natural, social or economic hazards and change? (Note which ones are most at risk)	All (0) most (1) half (2) a few (3) none at risk (4)
ES 2 Notes and comments	
ES 3 How is the status of the village economy evolving?	Seriously declining (0) getting worse over time (1) about the same as a few years ago (2) improving (3) prosperous (4)
ES 3 Notes and comments	
ES 4 Does the community believe it has the capacity to move its economy forward in a positive direction?	We can do nothing to improve things (0); there are one or two things we can try (1); we are trying a few things but they are not working yet (2) we are trying a few things and there are positive signs (3) making progress and doing well (4)
ES 4 Notes and comments	
ES 5 Have supplementary or alternate livelihoods been identified that can make a difference for individuals or the community as a whole?	We don't have any options or ideas(0) there are one or two ideas but not yet being tested (1) one or two ideas are being tested but not yet proven (2) several livelihood options have shown positive results (3); we have options that are making a big difference (4)
ES 5 Notes and comments	
ES 6 Are livelihoods dependent on outside market forces in a given year?	Totally (0) to a certain extent (2) not at all (4)
ES 6 Notes and comments	

Topic 2 Attention to the needs marginalized groups

Not at all (0); poorly (1) at times people get adequate help (2) most of the time (3) we do a good job (4)	
Introductory question: Who are the most marginalized groups in the village? *Marginalized people are those who do not benefit from the community's resources and or not involved in decision making processes at the community level.*	
Notes and comments	
Question or indicator	Coding scheme for responses
ES 8 Does the communities do a good job in taking care of the needs of disadvantaged groups?	Not at all (0); poorly (1) at times people get adequate help (2) most of the time (3) we do a good job (4)
ES 8 Notes and comments	