A Management and Adaptation Planning Guide for Natural Resource Managers*

What this Guide Provides

This document was developed in 2006 for the Pacific Islands Managed and Protected Area Community (PIMPAC) to provide a step by step guide for Marine Managed Area (MMA) management planning. However, given more recent interest in incorporating climate change adaptation concepts into existing planning processes, this guidance has been updated/revised to include guidance on understanding climate change impacts in a site as well as how to include adaptation in the planning process.

This guide provides facilitators with a step-by-step process for facilitating the development of management and adaptation plans for locally managed areas. For this guidance, "locally managed areas" are defined areas with clear boundaries and managed primarily by a community and their partner agencies/organizations. For the purposes of this guidance (and specifically for community based adaptation planning), a locally managed area refers to a whole community and all it's resources (both social and natural). However, the management planning and adaptation process can be used for a specific section or zone of the community under specific protections (e.g. a marine managed area, a protected watershed).

While the original PIMPAC management planning guidance was primarily focused on understanding and abating man-made threats to target marine resources, this version has been expanded to address climate change impacts to marine and terrestrial resources as well as social resources. Additionally, this process can be used to explore ALL climate change threats/impacts (including threats to targets beyond natural resources). However, given the nature of the original document, there is a strong focus on "nature-based adaptation planning". It is important therefore to partner with various agencies/organizations throughout the process who can provide more detailed information and input on aspects important for adaptation planning such as hazard management, health, and education.

Several extremely helpful guides to management and adaptation planning exist. This document is not intended to replace those guides but to complement them and provide the facilitator with an easy-to-follow process to complete a management and adaptation plan. A person who has even just a little experience in facilitation should be able to use this guide to facilitate a management and adaptation planning process with a Planning Team. The result will be a simple and straightforward management and adaptation plan for your locally managed area.

This document provides suggestions on how to facilitate a group through the topics outlined below. The document divides working on each topic into Steps that each have one or more exercises. The guide provides information on the purpose of the steps, details on each of these topics, a suggested facilitation process and background information to help facilitate the exercises, and worksheets for the participants to use.

Finally, new sections and information specific to climate change adaptaion planning have been highlighted in red and/or marked with the sun symbol. This was done to clearly demonstrate where the climate lens has been incorporated into the existing management planning process, especially for those managers who have been regularly using the existing PIMPAC guidance.

What this Guide Does Not Provide

This guide does not provide facilitation training but does provide suggestions on how to facilitate each step in the process. Individuals who use this guide should have a basic understanding of facilitation.

This guide does not provide a process for addressing multi-stakeholder conflict. In many cases, different interests groups may have differing opinions about how a particular area should be used. It is important to try to manage this conflict before you start the management and adaptation planning process. Numerous guides provide suggestions on how to do this. This guide, however, assumes that the individuals involved in the management and adaptation planning process have the authority to complete the plan and have gathered input from various stakeholder groups. By all means, a process for gaining stakeholder input and for sharing the plan with stakeholders is absolutely essential. Some basic ways to do this are covered in this document. However, we do not provide detailed guidance on how to address stakeholder conflict.

* The original guide was prepared by Scott Atkinson of the Community Conservation Network. The update has been prepared by Scott Atkinson, as a independent contractor, Meghan Gombos of Sea Change Consulting, and Dr. Supin Wongbusarakam, as an independent consultant. The original and this update include text and materials from:

"Parks, J., D.Wusinich-Mendez, K.Thurlow, E.Carey, and S.Moss. 2006. *Materials Used for the Bahamas National Park System Management Planning Training.* Technical report produced by the National Ocean Service of the United States National Oceanic and Atmospheric Administration, The Nature Conservancy Bahamas, and The Bahamas National Trust. Nassau, Bahamas. 49 pages."

This Guide is divided into the following Sections:

INTRODUCTION TO MANAGEMENT AND ADAPTATION PLANNING –

I. What Is a management and adaptation plan?
II. Why Is Creating a management and adaptation plan recommended and what are its benefits?
III. Characteristics of a good management and adaptation plan
IV. The contents of an effective management and adaptation plan
V. What to do before you start management and adaptation planning
VI. The steps to creating a management and adaptation plan

THE MANAGEMENT AND ADAPTATION PLANNING PROCESS

Step 1: Getting Organized to Start Management and Adaptation Planning.

Core Group Meetings focused on:

- Identifying why you want to create a management and adaptation plan
- Asking key questions to get organized for the planning process
- Identifying stakeholders
- Preparing a time line to guide development of the plan

Step 2: Orienting the Community

Community/Stakeholder Meetings focused on:

- Reviewing reasons for managing your site
- Reviewing basic information about management and adaptation plans and the process
- Reviewing activities to date
- Providing awareness on tropical ecology and ecosystem services
- Providing awareness on climate change

Step 3: Where Are We Now? What's Happening in our Community and What's Important to Us?

- Mapping the Community and its Resources (social and biological)
- Carrying out Biological and Social Baseline Assessments
- Carrying out a Historical and Projected Timeline
- Developing a Seasonal Calendar
- Carrying out a Transect Walk
- Identifying, Prioritizing, and Mapping Natural and Social Resource Targets

Step 4: Where Do We Want to Go? Developing a Vision and Threat/Solution Model

Stakeholder Meetings focused on:

- Identifying the Threats and their Impacts (including climate and non-climate)
- Mapping the non-climate threats and CC impacts/threats
- Analyzing the Impacts and Causes of the Threats
- Completing a Strength, Weakness, Opportunity, Threats (SWOT) Analysis
- Completing a Vulnerability Assessment for Climate Change Impacts
- Prioritizing the Threats
- Identifying Possible Solutions
- Identifying Long-term, Medium-Term, and Short-term Outcomes

Step 5: How Will We Get There? Completing the Core of the Management and Adaptation Plan

Planning Team Meetings focused on:

- Developing Good Goals and SMART Objectives
- Identifying Management Activities
- Checking Compatibility of Objectives and Activities
- Prioritizing Management Activities
- Develop Zones and Regulations
- Developing a Site Description / Community Story

Step 6: Let's Make It Happen! Plan Review, Adoption, and Implementation

Stakeholder Meetings focused on:

- Community/Stakeholder Review
- Finalizing, Adopting, and Celebrating the Plan
- Implementing the Plan

Step 7: How are We Doing? Monitoring and Adaptive Management

Implementation Team focused on:

- Developing a Plan to Monitor Your Progress
- Adaptively Managing the Plan and the Project

INTRODUCTION TO MANAGEMENT AND ADAPTATION PLANNING

A. Purpose

As you facilitate the management and adaptation planning process, participants should begin with a clear understanding of management and adaptation planning, its benefits, and the reasons for creating a management and adaptation plan.

In this section of the Guide we discuss:

- **I. What Is a Management and adaptation plan?**
- **II. Why Is Creating a Management and adaptation plan Recommended and What Are Its Benefits?**
- **III. Characteristics of a Good Management and adaptation plan**
- **IV. The Contents of an Effective Management and adaptation plan**
- **V. What to do Before You Start Management and adaptation planning**
- **VI. The Steps to Creating a Management and adaptation plan**

You may use this information at several of the Steps in the management and adaptation planning Process. It may be important to share basic background materials in any meeting where the participants need some background knowledge and review of the elements of management and adaptation planning.
For example, you may find it important to go over all or some of this information at the initial Core Group meeting to get organized for management and adaptation planning and or at the initial Community Meeting to start the management and adaptation planning process. The facilitators of the management and adaptation planning process should be very familiar with this information so they can provide background information at any point during the process.

B. Facilitation Suggestions

1. If your group has very little background knowledge in site based management and adaptation planning, you may want to simply present the information in this session. This would include sharing a handout of the information. Provide opportunities during the presentation for participants to ask questions and discuss what you have presented.

2. Another option is to ask your group to brainstorm certain aspects of this introduction. For example, you may ask them to brainstorm about the benefits of management and adaptation planning or the characteristics of a good management and adaptation plan. We suggest that brainstorming be facilitated by asking participants to turn to their neighbor to discuss the topic for five minutes and then by asking the pairs to volunteer one or two of the items they discussed under each topic.

C. Background Information

Here we provide information that the facilitator can use to present key topics of this session.

I. WHAT IS A MANAGEMENT AND ADAPTATION PLAN?

In general a management and adaptation plan is…

> A document that guides all management activities to be implemented in an area. It details the resources of the area as well as the goal for its management, objectives, and activities that will be carried out. It sets out a program of management activity that will be carried out for the next three to five years.

This guide emphasizes that all management and adaptation plans should be user-friendly documents that can help to guide day to day management of a project. As a result, we do not promote the creation of plans that are so long or otherwise cumbersome that site based practitioners will not use them on a daily or weekly basis.

A management and adaptation plan should include both measurable objectives and a set of activities that are designed to achieve these objectives. In many cases these activities will include zoning or designation of various management regulations. In all cases, zoning and regulations should be designed to ensure that the plan will achieve its primary objectives.

We also believe that it is critical that the management and adaptation planning process has sufficient stakeholder involvement and includes traditional and local knowledge as much as possible.

This guide will help site based practitioners go through a series of steps to create a management and adaptation plan that will meet the criteria discussed above.

II. WHY IS CREATING A MANAGEMENT AND ADAPTATION PLAN RECOMMENDED, AND WHAT ARE ITS BENEFITS?

There are several reasons that we recommend the creation of management and adaptation plans for communities, and/or managed and protected areas. The process of developing a management and adaptation plan can clarify the management goal and objectives, which can help to prioritize the use of limited resources available for management. Also, if the plan is well designed, it can be used as a day-to-day guide for management. Without a good management and adaptation plan, it is very possible that preservation, development, and use activities can occur in a haphazard way with little consideration for the implications. The result is likely to be lost opportunities and damage to important resources. Some of the benefits of good management and adaptation plan are listed below.

Improved management of the area by:

1. Providing a clear understanding of the protected area and its resources,
2. Providing guidance for managers in the form of a framework for day-to-day operations,
3. Providing a long-term vision and guidance on how to reach this vision,
4. Helping to identify and define measures of management effectiveness by providing clear objectives and activities,
5. Providing continuity of management by helping to link management activities to a comprehensive plan, and
6. Maintaining momentum toward efforts to manage the area.

Improved use of financial and staff resources by:

1. Prioritizing management activities to make sure resources are devoted to priority areas and
2. Highlighting where additional resources (human and financial) are needed to manage the protected area.

Increased accountability by providing a mechanism for:

1. Supervision of the area manager and staff since their objectives and activities are clearly articulated and
2. Communicating with the public and various interest groups about the purpose of the site.

Improved communication by:

1. Identifying key audiences with whom the manager needs to communicate,
2. Clarifying the messages to be communicated,
3. Providing a means of communication with the public to explain policies and management activities, and
4. Promoting and publicizing the managed area to a wide range of stakeholders.

Improved long term resilience of the community by:

1. Understanding vulnerability of natural and social resource targets to climate change threats
2. Long term planning that prepares communities for possible climate change impacts and increases their ability to cope with possible negetive impacts
3. Prioritized adaptation strategies to help prepare for and possibly address the most severe impacts from climate change on the community

III. CHARACTERISTICS OF A GOOD MANAGEMENT AND ADAPTATION PLAN

While there are not set rules for what makes a good management and adaptation plan, some helpful general guidelines do exist. You can use these as a checklist when reviewing the completeness of your management and adaptation plan.

In general a good management and adaptation plan has the following characteristics:

1. **Clear**: Easy to read, jargon-free, and well presented.
2. **Concise and comprehensive**: No longer than is absolutely necessary, but with enough information to fulfill its functions.
3. **Accurate**: Without major errors and with the reasons for all judgments clearly explained.
4. **Logical**: Based on a thorough assessment of the site and with a clear rationale given for all objectives and activities (e.g. based on best scientific and social information available).
5. **Acceptable:** To all those with interests in and emotional attachment to the site.
6. **Practical**: With clear objectives and realistic methods for achieving them, resulting in desired outcomes which can be monitored.
7. **Focused**: Fulfilling its purpose as a tool for site management, meeting the needs of its users and satisfying any legal or other obligations.

IV. CONTENTS OF AN EFFECTIVE MANAGEMENT AND ADAPTATION PLAN

1. **TITLE PAGE –** Name of site, names of lead group(s), date, version

2. **EXECUTIVE SUMMARY** – Key issues and decisions; summary aims, approach, and activities

3. **TABLE OF CONTENTS**

4. **INTRODUCTION** – Define the purpose and scope of the plan; explain the legislative or other basis and authority for the plan's development; summary timeline of plan development

5. **SITE DESCRIPTION**

   (a) Location and governance:

   - Location and size of the area
   - The purpose of the area (why was it created)
   - The legal status of the area
   - Who has the legal authority to manage the area
   - The current management system

   (b) Biophysical setting:

   - The key physical features of the area (climate, geology, geomorphology, hydrology, soil characteristics)
   - The key biological features of the area (communities, flora and fauna including any outstanding natural resource features) and the historical features of the area

   (c) Socioeconomic and cultural setting:

   - The cultural features (traditional communities, cultural practices)
   - The socioeconomic characteristics (occupancy, access, income, tenure, livelihoods, other basic data and trends among local communities and their dependence on natural resources for sustinence or income)
   - The stakeholder groups with an interest in the area (including governement agencies, NGOs, and church organizations, that work with the community regularly)

   (d) Conservation status:

   - The current uses of the area
   - The threats to the area (immediate and long term)
   - The obstacles to effective management
   - The management successes in the area
   - The current management challenges

- The history of management and adaptation planning in the area
- Why a decision has been made to complete this management and adaptation plan

6. THE MANAGEMENT APPROACH

(a) Description of the management and adaptation planning process that was used to develop the document

(b) Vision and Treat Analysis

(c) Vulnerability Assessment of priority resource targets

(d) Threat Prioritization

(e) Goal and Objectives

(f) Zoning and regulations

7. OPTIONAL SECTIONS

(g) Roles and responsibilities of partners

(h) Enforcement plan

(k) MMA budget and financing plan

(l) Sustainability plan

8. APPENDICES (Suggested)

- Management Activities in One Year Activity Plan
- Habitat classifications
- Plant (flora) species lists if available
- Animal (fauna) species lists if available
- Special features at the site

MAPS: The suggested Maps may be combined or Available Maps may be included

- Map 1 - Location
- Map 2 - Land/water tenure and jurisdiction
- Map 3 - Land topography and seabed bathymetry
- Map 4 - Geology
- Map 5/6 - Dominant plant and animal communities
- Map 7/8 - Major Cultural and socio-economic features
- Map 9 - Major commercial and non-commercial uses

- Map 10 - Major use conflicts and threatened resources
- Map 11 – Zoning
- Map 12 – Historical climate events and impacts

V. WHAT TO DO BEFORE YOU START MANAGEMENT AND ADAPTATION PLANNING:

For most projects there are several steps in the development of an locally managed area that will be undertaken before you are ready to develop a management and adaptation plan. These are basic project design steps that include initial community contact, sharing basic information with the community, gathering important background data, developing and carrying out an initial set of management activities.

A locally managed area may operate for years without a full management and adaptation plan but the basic community engagement and project design steps are absolutely essential to the success of the project.

This guidebook does not provide complete detail on how to carry out these community engagement and project design steps. Instead the Guidebook assumes that your project has already made a decision to develop a management and adaptation plan and is now seeking guidance on how to prepare that plan. As a result, this Guidebook should not be used to provide guidance on community engagement and basic project design. Instead the Guidebook should be used once the project is operating and has decided to develop a management and adaptation plan.

Steps that should be carried out before you start management and adaptation planning include:

1. **Initial Community Contact:**

   Most locally managed areas that are supported by an outside organization start through initial discussions with a few community members who are particularly interested in protecting local resources or improving community welfare. The discussion at this point is usually broad with a focus on trying to understand the concerns of the community and brainstorm some strategies that may help.

2. **Information, Education, and Communications Programs**:

   Information, Education, and Communications (IEC) Programs are critical and are a very good starting point for development of a locally managed areas. Even if a community is already enthusiastic about creating a locally managed areas, you should undertake IEC in the area to help them understand the basics of tropical island ecology and climate change, the possible benefits of locally managed areas, the limitations of locally managed areas, and other key facts that they need to know as they move forward. Not all community members will be familiar with how an locally managed areas may help them. It is important to understand that locally managed areas are only one tool that can be used to address the threats to their natural resources. Other tools should be explored as well. There may be problems such as sedimentation that locally managed areas alone will not help. Later in the process, it will become clear if a locally managed areas will be the primary strategy for the area or if other strategies may be necessary.

3. **Gathering Basic Community Data**: It's also very important that you gain a basic understanding of the community situation. Methods that can be used to do this include:

   - Participatory Coastal Resource Assessment (PCRA): This process provides a good understanding of key natural and social resources. A map of these resources should be made. This map should be updated later during community meetings when natural resource targets and threats are being discussed.
   - Stakeholder Analysis: This process will help to identify key stakeholders and provide a better understanding of their interests.

4. **Developing and Carrying Out an Initial Set of Activities**

   An initial set of priority activities can help to guide the development and implementation of a locally managed area. Many projects chose to do this simple activity plan first and get going on activities early in the process. This helps community members to get involved in the area and gets activities started. It is common that community members can become discouraged if all they see is planning and no activity. While developing a full management and adaptation plan is important, it can take a long time. As a result, it may be good to develop an initial list of activities that can be implemented during the development of the plan. Examples of activities include:

   - Carrying out a baseline assessment of the marine area managed by the community
   - Undertaking IEC with key community members
   - Youth Education Activities
   - Undertake community interviews to better understand people's concerns
   - Collecting information on human use
   - Training community members in biological monitoring

5. **Making a Decision to Create a Management and Adaptation plan**

   The decision to undertake management and adaptation planning should not be taken lightly, it can requires a great deal of time and effort. As a result, you should determine if you are really ready. The worksheet on the next page will help you decide if you are ready to create a management and adaptation plan.

V1. Are You Ready to Develop a Management and Adaptation plan?

We strongly recommend the development of a simple management and adaptation plan for all locally managed areas. While locally managed areas may operate well for years without a management and adaptation plan, a simple management and adaptation plan can be very important to the success of the area. For a new locally managed area, a simple management and adaptation plan will help the community to clearly identify their concerns and their objectives. This is very important as management activities should be designed to address the community's concerns. This will strongly influence zoning and rules that the community develops. For an existing locally managed areas, a simple management and adaptation plan will help with adaptive management. It will review and clarify objectives and help to identify if ongoing activities, rules, and zoning are helping to achieve the objectives. If the area is not meeting its goals, then adaptation of the project may be necessary. In both new and existing cases, a management and adaptation planning process can help the community consider a long term perspective and how to prepare for the potential impacts of climate change so as to experience as little negetive impact as possible.

The decision to develop a management and adaptation plan should not be taken lightly. You must be sure you have sufficient time, resources, and authority to develop the plan. In deciding to develop a management and adaptation plan, you should consider the following:

1. Why do you think this is the right time to develop a management and adaptation plan?

   Ask this question first and then go on to discuss all the other questions. At the end of the questionnaire, ask yourself if you are really ready to start the management and adaptation planning process.

2. Have you undertaken basic outreach steps with the community?

   It can months or years to do the basic outreach needed to engage a community on an locally managed area project. Typically a handful of community members will be motivated to undertake a project, but it's important to outreach to other community members to understand their concerns and get them involved in the project.

3. Is there strong motivation by community members behind the locally managed area project or do you need to do more outreach?

   Before you move forward to undertake a project, you should be sure that a broad cross section of the community understands the project and has had a chance to provide their input. It is important that there is motivation from the community. Otherwise, the project may not go anywhere or people might purposely work to undermine it.

4. Have you done basic education with community members on tropical island ecology, climate change and the benefits and limitations of locally managed areas?

It's very important that community members understand the basics of tropical island ecology, climate change, and the benefits as well as the limitations of locally managed areas. There are many examples around the world where a community has chosen zoning of a site without using sufficient ecological information and the sites does not yield the results they want. For example, if a community wants to increase the population of grouper but they chose a site that does not include appropriate grouper habitat they will not achieve their objectives. It is vital that community members understand the basics of tropical island ecology and take site-specific information into consideration when choosing the site and rules for their locally managed area.

5. Do you have enough basic information about the site?

   Have you undertaken basic surveys of the site and the community? Do you know where key habitats are located? Do you know who the key stakeholders are and who has the authority to manage the site? All this information and more is important to the Plan.

6. Have you already chosen the locally managed area site and regulations?

   In many locally managed area projects, one of the first things a community will do is select the zone for management. While this may be appropriate in some cases, we recommend waiting to finalize site selection (or zoning) and regulations until you have gone through the management and adaptation planning steps. It's good to have a clear understanding of your target natural resources and objectives before you pick your zoning and regulations.

7. Do you have the authority to develop a functional management and adaptation plan?

   It's important that the authority to develop a management and adaptation plan is secured before the planning process begins. In some cases there may be no formal system for management and adaptation planning authority and the community may do it completely for its own use. Even in these cases, it's important to articulate under what authority the plan will be prepared.

8. Can the community and their partners devote sufficient time to develop the plan?

   At a minimum, development of a management and adaptation plan will require three to five half day community meetings and five or more meetings of a planning team (each of two to four hours). It is important that the community and their partners have enough time over the course of six months or less to develop the plan. We recommend six months for developing the plan as if it takes much longer, people may become bored with the process.

9. Do you have staff or partners that can facilitate the management and adaptation planning Process?

   It's extremely helpful to have a neutral facilitator to guide the management and adaptation planning process. Also, to the degree possible this person should have some experience in guiding the management and adaptation planning process. While a community leader may

help to convene the meetings, it's important that they not facilitate as they should participate in the discussions.

10. Are you or do you need to undertake activities to get the community involved in the project? Do you have enough time to undertake management and adaptation planning and the activities?

    Even while you are management and adaptation planning, it is very helpful to continue to carry out activities that will help to change the situation at the site. As a result, it is important that you be sure you have enough time to continue carrying out some basic project activities while you conduct the management and adaptation planning.

D. Worksheets: Pre-Planning Exercise: Are You Ready to Develop a Management and adaptation plan?

Question	**Yes, No, Maybe**	**Explanation with as many details as possible**
1. Do you think this is the right time to develop a management and adaptation plan and why?		
2. Have you undertaken basic outreach steps with the Community?		
3. Is there strong motivation by community members behind the locally managed area project or do you need to do more outreach?		
4. Have you done basic education with community members on tropical island ecology, climate change, and the benefits and limitations of locally managed areas?		
5. Have you already chosen the geographic scope of locally		

managed area site (e.g marine managed area, entire community)?		
6. Do you have enough basic information about the site?		

Question	Yes, No, Maybe	Explanation with as many details as possible
7. Do you have the authority to develop a management and adaptation plan?		
8. Do community members and key stakeholders understand that management and adaptation planning will take a lot of their time and are they willing to devote this time?		
9. Do community members and key stakeholders want to undertake management and adaptation planning at this time?		
10. Do you have staff or partners that can facilitate and mentor the management and adaptation planning Process?		
11. Is the project undertaking any active field activities to get the community involved in the locally managed area?		
12. Do you have enough staff time to coordinate management and adaptation planning?		
13. Do you have necessary funding to host meetings, get to the site, etc?		
14. Based on the answers to these		

questions do feel now that it is the right time to start the management and adaptation planning process?		

VI. THE STEPS TO CREATING A MANAGEMENT AND ADAPTATION PLAN

The steps to creating a management and adaptation plan are detailed below. Each of these steps has one more corresponding modules in this management and adaptation planning guide. Each step will require one or possibly several meetings.

It is crucial that as part of the planning process, the planning team determine the output and the outcome that they need from each step before they are ready to move to the next step in planning. Outputs are the physical products that are created through the step such as the Threat/Solution Model or the Set of Objectives. Outcomes are the result of the step that will allow you to move forward and have a positive impact on the natural resource target.

In most cases, the main output will be a high quality written document that meets the guiding criteria of that step. Likewise the main outcome that is typically needed from a step is the agreement on the output from all relevant stakeholders. It is very important that you feel comfortable with your level of agreement on each step before you go to the next step.

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- Providing awareness on climate change

Step 3: Where Are We Now? What's Happening in our Community and What's Important to Us?

- Mapping the Community and its Resources (social and biological)
- Carrying out Biological and Social Baseline Assessments
- Carrying out a Historical and Projected Timeline

- Developing a Seasonal Calendar
- Carrying out a Transect Walk
- Identifying, Prioritizing, and Mapping Natural and Social Resource Targets

Step 4: Where Do We Want to Go? Developing a Vision and Threat/Solution Model

Stakeholder Meetings focused on:

- Identifying the Threats and their Impacts (including climate and non-climate)
- Mapping the non-climate threats and CC impacts/threats
- Analyzing the Impacts and Causes of the Threats
- Completing a Strength, Weakness, Opportunity, Threats (SWOT) Analysis
- Completing a Vulnerability Assessment
- Prioritizing the Threats
- Identifying Possible Solutions
- Identifying Long-term, Medium-Term, and Short-term Outcomes

Step 5: How Will We Get There? Completing the Core of the Management and Adaptation Plan

Planning Team Meetings focused on:

- Developing Good Goals and SMART Objectives
- Identifying Management Activities
- Checking Compatibility of Objectives and Activities
- Prioritizing Management Activities
- Develop Zones and Regulations
- Developing a Site Description / Community Story

Step 6: Let's Make It Happen! Plan Review, Adoption, and Implementation

Stakeholder Meetings focused on:

- Community/Stakeholder Review
- Finalizing, Adopting, and Celebrating the Plan
- Implementing the Plan

Step 7: How are We Doing? Monitoring and Adaptive Management

Implementation Team focused on:

- Developing a Plan to Monitor Your Progress
- Adaptively Managing the Plan and the Project

1. Get Organized!

Planning Team Meetings

- Identifying why you want to create a management and adaptation plan
- Identifying who should be involved
- Develop a Time Line to Plan

2. Orienting the Community:

What do we know?

Community Meetings

- Reasons for Creating a Locally Managed Area
- Reviewing Management and adaptation planning Process
- Providing Awareness on Tropical Marine Ecology
- Provide Awareness on Climate Change

3. What's happening in our community and what is important to us?

Community Meetings

- Mapping the community
- Biological and Social Baseline Assessments
- Historical and Projected Timeline
- Seasonal Calendar
- Transect Walk
- Identifying, Prioritizing, and Mapping Natural and Social Resources Targets

4. Management and adaptation planning:

Where do we want to go?

Community Meetings

- Developing Your Vision
- Identifying the Threats
- Mapping the non-climate threats and CC impacts/threats
- Analyzing the Impacts and Causes of the Threats
- SWOT Analysis
- Vulnerability Assessment Matrix
- Prioritizing Threats
- Identifying Possible Solutions
- Identifying Long-term, Medium-Term, and Short-term Outcomes

5. Management and adaptation planning:

How will we Get There?

Planning Team Meetings

- Developing Good Goals and SMART Objectives
- Identifying Management Activities
- Checking Compatibility of Objectives and Activities
- Prioritizing Management Activities
- Develop Zones and Regulations
- Developing a Site Description

6. Review and Adoption:

Lets Make it Happen!

Stakeholder Meetings

- Community/Stakeholder Review
- Finalizing, Adopting, and Celebrating the Plan
- Implementing the Plan

7. Monitoring and Adapting:

How are We Doing?

Implementation Team

- Developing a Plan to Monitor Your Progress
- Adaptively Managing the Plan and the Project

THE MANAGEMENT AND ADAPTATION PLANNING PROCESS

STEP ONE: GET ORGANIZED BEFORE YOU START PLANNING

This step will be carried out with the Core Group of individuals that are involved in the Management and adaptation planning process and will cover:

- Getting Organized Before You Start Management and Adaptation Planning
- Identifying Stakeholders and How to Involve Them
- Developing a Planning Time Line for the Management and Adaptation Planning Process

Step One should be carried out with the core group of people who are interested in creating a management and adaptation plan for the site. This should not be carried out with the entire community or stakeholder group. Several of the next steps discussed below provide an opportunity for the community and stakeholders to get involved and provide input to the management and adaptation planning process. However, Step One is more effective when carried out by a core group that will then move forward and oversee the management and adaptation planning process.

Step One assumes that you have already gone through the following stages in your project:

1. The basics of Project Design including: Initial Community Contact, Information, Education, and Communications (IEC) Programs, Gathering Basic Community Data, Developing and Carrying Out an Initial Set of Activities, Making a Decision to Create a Management and adaptation plan. These are covered in the section on "What to do Before You Start management and adaptation planning".

2. Determining that You're Really Ready to Create a management and adaptation plan. Discussed in the section, "Are you Ready to Plan"

If you have gone through these stages and determined that you are really ready to create a Management and adaptation plan, the first thing to do is to Get Organized.

The following topics should be discussed with the core people that are motivated to help develop the management and adaptation plan. The worksheet that follows will help you to get organized to start the management and adaptation planning Process.

1. **Clearly Determine Why you Want to Develop a Management and Adaptation Plan at this Time**

   The exact reasons you want to create a management and adaptation plan should be clear to core team of people involved. There should be agreement on this topic before you move forward. Later in the process, you should be able to clearly articulate the reasons for creating the management and adaptation plan to the community, stakeholders, and partners such as government agencies and non-profit partners.

2. **Identify a planning team and the lead organization or individual.** The planning team members (and or the organizations they represent must have sufficient authority to undertake the planning process and must have sufficient time and resources to lead and follow up on the process.

   In addition, the Planning Team should include the following characteristics: a strong interest in the area, considerable knowledge of the area, the needed authority to undertake management and adaptation planning, significant time to devote to the management and adaptation planning process, a commitment to the planning process. It is helpful if the team can represent different skill sets. For example, some members may have a biological background, while others may be cultural practitioners and still others may have economics training. The mix of skills will be best determined on a case-by-case basis. However, the more diverse the team, the more knowledge they will bring to the process. Also, depending upon the complexity of your site, you may want to consider involving individuals from different stakeholder groups. Include at least one member with management and adaptation planning experience or retain an outside person to help with the design and carry out the process.

   It's important to realize that your Planning Team may change during your initial stakeholder meetings. So at this stage just identify an initial Planning Team and later this may be updated during stakeholder meetings.

   Finally, identify one person or a small group of people who will be the lead coordinators on the planning process. This role is extremely important.

To carry out climate change adaptation planning the group should consider that a multi sector planning team is needed to ensure all aspects of climate change are considered in the planning process. Therefore the group should review the local, regional, and international agencies/organizations that have expertise and could assist in the planning process. Sectors that should be represented either as part of the planning team or consulted throughout the process include:

- Natural resource experts (both terrestrial and marine)
- Community development experts
- Water resource experts
- Health experts (specifically those familiar with health related to environmental hazards such as flooding, drought, etc)
- Hazard preparedness experts
- Educators

3. **Clearly identify the purpose of the managed area and ensure that it is understood by all involved.** The broad purpose of the area should have been set out in the legislation or other formal agreements designating the area. However, it may be necessary to re-examine the purpose since it will set the direction of the plan. If the broad purpose of the area has not

yet been articulated or needs to be adjusted, this should be completed before planning begins. You also should communicate the purpose to the primary stakeholders before beginning the management and adaptation planning process.

4. **Determine who the audiences for the plan are.** management and adaptation plans are prepared mainly for regular use by area managers, but they are not intended as detailed work plans. Members of the public, the government, commercial interests, and neighbors are also important users. In some situations, traditional owners, local government officials, and commercial operators can be key users. The style of presentation adopted should reflect the most important user groups.

5. **Clarify and agree upon a procedure for the approval of the final management and adaptation plan**. If the approval of external parties (e.g. funding bodies, advisory committees, and government departments) is required, the procedures to be followed in achieving this should be identified. Parties should also agree upon a timetable for the submission of a final version for approval.

6. **Collect necessary information.** It is important to gather some key information before you embark upon the management and adaptation planning process. This includes ecological resources and their general condition, cultural resources and their general condition, physical features, key features of the socio-economic environment, land and ocean uses, threats to the area, facilities, and user characteristics and their impact on the area. Having all of this information collected beforehand will facilitate the management and adaptation planning process. You may also want to include more detailed data collection and research as one of the recommended activities of your management and adaptation plan.

It is critical to gather information on the most up to date climate predictions for the region as part of this phase. This information can be used throughout the planning process to support discussion on likely future scenarios that should be considered when developing and prioritizeing adaptation strategies.

Additionally, collect information on major climate events that have occurred in the area (e.g. typhoons, floods, drought, etc) over the past 50-100 yrs. and their associated impacts to the communities' natural and social resources. Finally, any additional information on how the community coped with these past hazard events is also important.

Historical photos and maps can also be useful for climate change planning.

7. **Identify the steps to be followed in applying the planning process, their sequence, and the methods to be used.** Many organizations have their own guidelines on the approach to be followed. If not, design an approach that will best suit the managed area and its management context. The process recommended through this manual may be adapted to suit local needs.

8. **Identify stakeholder groups that should be involved in the process. See Exercise Two.** Stakeholder involvement can run the gamut from the day-to-day involvement of a broad range of stakeholder groups, to simply getting input from stakeholder groups, to only informing stakeholder groups about the decisions that have been made once the plan is complete. The approach for stakeholder engagement will vary greatly depending on your site. Before you start planning, undertake a basic stakeholder analysis to identify who should be involved in the planning and how they should be involved. See Section Two in this guide for a basic stakeholder analysis process. Be sure to apply this process before you start planning.

9. **Prepare and follow a well-laid-out planning timeline for the management and adaptation planning process. See Exercise Three.** Project management timelines or work plans are often used to help guide the implementation of the planning process. They help to organize and control the production of the management and adaptation plan.

EXCERCISE ONE: KEY QUESTIONS TO GET ORGANIZED

A. Exercise Purpose

This session will help you to get fully organized to start the management and adaptation planning Process. This step assumes that you have already determined that you are ready to create a management and adaptation plan.

B. Facilitation Suggestions:

This exercise should be carried out with a small team of people who are very involved in the site and are interested in carrying out the management and adaptation planning process. This may include representatives of a community council, the locally managed area governing body, or some other group that is very involved in the site. If possible also include representatives from key agencies who can provide guidance on climate change adaptation for various sectors including (natural resource management, food security, coastal planning and development, water resources, health, and hazard preparedness)

Since your team is probably relatively small you can chose to fill out the questions in plenary or break into small groups and then compare your answers.

(1) Fill out the following table to answer the key questions about your managed area. This will help you to get organized to start the management and adaptation planning process.

Why do We Want to Develop a Management and Adaptation Plan at this Time and Are We Ready?

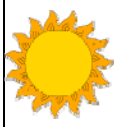
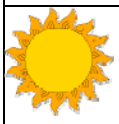
1. Why do you want to prepare a management and adaptation plan at this time?	
2. Do you have someone to help lead the management and adaptation planning Process? Please explain	
3. Do you have the Authority to Undertake management and adaptation planning? Please explain	

4. Do you have sufficient time and financial resources? Please explain	
5. Will having a plan at this time help you to advance your project? Please explain	

Review your answers to these questions and determine if you think now is the right time to initiate the management and adaptation planning process for your site.

If you conclude that now is the appropriate time to start the management and adaptation planning Process, you should answer the following questions with your core team to get organized.

1. What is the overall purpose of the managed area?	
2. Who will be included in your planning team and why? Please describe who they represent and their skills. (Please Note: Stakeholder Analysis is carried out under Exercise Two below).	
3. What management authority does your planning team have?	
4. Who will use the plan and for what purposes?	
5. How will the plan be finally approved?	
6. What planning has been done for the area in the past? How will you build on or integrate with this?	
7. What basic information have you collected about the area? For example: ecological and cultural resources and their	

condition, physical and socio-economic features, land and ocean uses etc.	
8. What other information needs to be collected before you can start planning?	
 9. Who needs to be involved to address climate change adaptation in the planning process?	_ Health Agency/organization (specify which) _ Natural Resource Agency/organization (specify which) _ Water Resources Agency/organization (specify which) _ Hazard Preparedness Agency/organization (specify which) _ Education Agency/organization (specify which) _ Food Security Agency/organization (specify which)
 10. What information needs to be collected involved to address climate change adaptation in the planning process? Consider up-to date climate predictions for the region, historical maps and photos of the area, historical information about climate events.	

EXCERCISE TWO: INVOLVING STAKEHOLDERS

A. Exercise Purpose

This Exercise provides a straightforward approach for identifying the individuals and organizations that have a stake in your area and how you will go about involving them in the planning process. This exercise is extremely important as depending on how you engage them various stakeholder groups can either be a great help or a great hindrance to your initiative.

B. Facilitation Suggestions

The stakeholder discussion is best held with the entire core group present. The discussion should happen one of the very first steps in the planning process. The worksheet below will help you to identify the various stakeholders and how you will involve them in the management and adaptation planning process. We suggest that the Core Group fill out this worksheet early in the Planning process as a part of getting organized. However, once the Planning Team is comprised later in the process it may be helpful for this team to revisit and update the Stakeholder Analysis as necessary.

We suggest that one large group of Core Group members be asked to work on this process together with someone facilitating. The discussion that will take place in the large group is extremely valuable. If your Core Group is very large (more than 12 people) you may find it useful to divide into one or more small groups but you should definitely give enough time for the entire group to discuss and agree on the results.

C. Background Information for Facilitators

Stakeholders are defined as: Any individual or organization that has a legitimate interest in the area or resources of the area. This interest should be legally or traditional established.

The relative stake or interest of different groups will vary and in some cases may not be easily determined. As a result, a rule of thumb is that any group that has a traditional or legal right to access or manage resources should be consulted. Likewise, any group that can disrupt or otherwise limit the success of your initiative should be consulted. Examples of typical Stakeholder groups include: All Community Members, Traditional Fisherman, Local Government Agencies, Legally Permitted or Well Established Marine Recreation Operators, the local Boating Community, the National Government, and others as relevant. We do not typically consider illegal fisherman as legitimate stakeholders. But they may be, particularly if they are members of the local community and are using illegal methods because of high fishing competition or severe poverty. It is important to remember that Stakeholder identification must consider the nuances of the local situation. In general it is better to keep consultations open to as many groups as possible.

However, you must also carefully consider when to engage different groups. Since this guide is focused on Community-based Managed Areas we typically recommend that the community members have a chance to express their interests and recommendations for management before outside stakeholder groups are engaged. However, the situation will vary depending on the site and the relationships between stakeholder groups.

The approach to stakeholder engagement will be up to each individual site. The approach to stakeholder involvement will vary greatly depending on the site, the number of stakeholders, their involvement or "stake" in the area, the ownership and management authority of the area, the complexity of the situation, and many other factors. At some sites, you must engage a broad range of stakeholders in the entire planning process or they may undermine your decisions. At other sites, the authority of the community or the agency is so strong that stakeholders need only be informed about the decisions that are being made for the area.

Below we provide some examples of approaches that have been used successfully.

It is very important to talk with a wide variety of stakeholders to get a sense of their concerns and ideas before you start the management and adaptation planning process. Once you have that stakeholder input, it is generally more effective for the management and adaptation planning process to be carried out by a team of designated individuals with a focus on the community interest. If stakeholders have been afforded an opportunity to provide input, they are typically quite happy for a planning team to develop the plan. After the draft plan is complete, however, it is very important to loop back in with all the stakeholders so they can review the plan. A wide range of options for stakeholder engagement exists, including the following:

1. Detailed involvement of all major stakeholder groups in the planning process. This approach has been used in some managed areas. However, it can often degrade into a very unproductive process due to the difficulty of developing a plan with a large group. Also, it may quickly dilute the community focus as some outside stakeholders may have strong interests that are different than the communities.
2. Input sought from stakeholders through focus groups with a smaller planning team developing the Plan. This team would first and foremost represent the community interest. After a draft is complete, the stakeholders will have a chance to review it. You may or may not have stakeholder representatives on the planning team
3. The community or agency has a high degree of authority, so they choose not to consult outside stakeholder groups. In this case, the planning team may choose only to inform various groups about the decisions in the plan.

Typically the second approach is the most likely to lead to success. However, the devil is in the details. You have to think very carefully about how many focus group meetings you should have, how often you should inform stakeholders about your progress, and how many opportunities outsiders should have to provide feedback on the plan. In most locally managed areas, the more effort you spend involving and reacting to stakeholder concerns, the better your chance of getting true buy-in and compliance with the plan's regulations.

D. Worksheets

(1) Fill out the following worksheet to clarify the stakeholders for your locally managed area and how you will involve them in the management and adaptation planning process.

What are the main groups of people involved in the area?	**Describe their interest in the area**	**Describe the validity of their interest or "stake"?**	**How important is this group to the planning process?**	**How and When would you like to involve them in the planning process?**
Local community members (including men, women, and youth)	Clan ownership of many of the resources. Recognized resource use rights	Highly valid. They have had a role in the area for generations	Very important	From the very beginning of the process. Involve them in Community visioning process, all regular community meetings, quarterly feedback opportunities
Fishermen from other villages on the island	Historically they would fish in the area only by asking permission. Now they often fish without asking permission	Low. Historically we would not deny them access as long as the stock was healthy. Now they come in without asking	Medium. They may choose not to follow the rules unless they are involved. But they have little valid stake in the area.	Inform them that the process is going on and ask for their input after the community has carried out Step One to Three of the process. Ask them for their input on the activities and the rules. Inform them of our decisions, pointing out how we have involved their concerns
Illegal fishermen from far outside the area	Sharking fining, tuna fishing, catching turtles, etc.	None. They are fishing completely illegally in the area	Not important	Inform them of the rules once established. Enforce when necessary

Commercial SCUBA operators	Taking tourists into the MMA to dive	Some of them have permits to operate. Others have no legitimate stake but have invested funds	Important as they have a strong lobby with the government	Inform them early one about the process. Ask them where they take divers. Include their concerns in mapping. Hold a focus group with them after the community has carried out Step One to Three
Enforcement agency	They are mandated to enforce the rules of the area	High. Once rules are law, they must enforce them.	Very important. what is practical in terms of enforcement	Inform them early on about the process. Ask for their input early on and invite them to key meetings. Ask them to have a focus group after the community has gone through Steps One to Three

INVOLVING STAKEHOLDERS

Blank Worksheet

What are the main groups of people involved in the area?	Describe their interest in the area	Describe the validity of their interest or "stake"?	How important is this group to the planning process?	How and When would you like to involve them in the planning process?

EXERCISE THREE: CREATING A PLANNING TIME LINE

A. Exercise Purpose

Management and adaptation planning can take a very long time, particularly if the planners do not create and follow a timeline for the management and adaptation planning process. While it's important to provide enough time for adequate consultation and community involvement it is also important that the management and adaptation planning process not take so long that the community grows tired.

Creating and following a timeline for the management and adaptation planning process is important as it will provide an agreed to plan for carry out the planning process. It's extremely important that the core group identify a date by which they want to complete the plan and then create a timeline to ensure that they finish by this target date. Of course the team has to be flexible and allow for unforeseen changes in the process. But if everyone on in the core group has agreed to a timeline and a set of responsibilities, everyone should do their best to stick to this timeline.

B. Facilitation Suggestions

We recommend that the planning timeline is completed by core group that wants to complete the management and adaptation plan. You may not have created a formal planning team yet, so the timeline may remain a draft until the team is comprised and has a chance to input on the timeline.

We suggest that one person is tasked with facilitating the core team to fill out the planning timeline. You can use the example format provided below or develop a format that works better for you.

You should first review the entire planning process with the core group. It is helpful to review the planning process flow with them. Then using a flip chart or a LCD projector fill out the timeline format below. The first question should be:

By what date do we want to complete the plan?

Then you can work backwards from that date to fill in the due date for each step.

Also, it's important to discuss with the group how long you think each step will take in the planning process. It will vary from community to community. So look carefully at each step and determine roughly how many meetings you think each step will take in your site.

(1) Fill out the following worksheet to develop a timeline for your specific management and adaptation planning process. Here we just provide a sample with a few activities, not an entire planning process.

Example:

Planning Step and Activity	Due Date	Leader	Due Date Shown in 12 Month Calendar

			1	2	3	4	5	6	7	8	9	10	11	12
Getting organized														
1. Core Group Meeting	**1/10/09**	**Coord.**	**X**											
2. Complete getting organized worksheet	**1/20/09**	**Coord.**	**X**											
3. Completing Stakeholder Worksheet	**1/20/09**	**Coord.**	**X**											
Where are We Now														
1. First Community meeting	**2/15/09**	**Coord.**		**X**										
2. Second Community Meeting	**3/1/09**	**Coord.**			**X**									
3. Complete Vision and Problem Solution Model	**3/15/09**	**Coord.**			**X**									

PLANNING TIMELINE

Blank Worksheet

Planning Step and Activity	**Due Date**	**Leader**	**Due Date Shown in 12 Month Calendar**											
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**

STEP TWO: ORIENTING THE COMMUNITY

This step should be carried out through one or more community/stakeholder meetings. It will help the community to understand the reasons for creating a managed area and carrying out a management and adaptation plan. The Step will cover:

- Discussing the Reasons for Creating a Locally Managed Area
- Reviewing Locally Managed Area Activities to Date
- Reviewing the Management and Adaptation Planning Process
- Providing Awareness on Tropical Island Ecology to help Community Members Understand the Importance of Managed Areas
- Providing Awareness on Climate Change, Climate Variability and Potential Impacts

By the time you are ready to start preparing a management and adaptation plan, a lot of work will already been done for your locally managed area. Reviewing this material will help set a strong foundation for the community and stakeholders. This is particularly important if there are participants who have come into the process recently and may not be fully aware of what has happened previously. Likewise, it is important for community members to fully understand the process that will be used to create a management and adaptation plan for the site.

Additionally, this step will also provide more detailed information on tropical island ecology and climate change. This information is important to help community members understand the value of managed areas and how they can contribute to: improving the condition of their natural resources, enhancing their quality of life, and reducing their vulnerability to climate change impacts.

One or more meetings will be held with the community/stakeholders to review the following:

- Discuss reasons for creating a locally managed area. It is very important for the community to reiterate the importance of managing their resources and preparing for climate change and why a managed area has been chosen as a strategy for this community. This may lead into a discussion about the benefits of area based management and what people expect to get from improving the management of important resources in the community.

- Review locally managed area activities to date. Any activities that have been undertaken to date in the preparation of developing a managed area should be reviewed to bring everyone up to date. This can include review of baseline studies, participatory appraisal results, community mapping, and any thing else that has been done.

- Discuss background information about management and adaptation plans and the process for creating these plans. Reviewing the management and adaptation planning process steps will help people to understand the steps that they must go through to create the plan.

- Provide education and awareness on basic tropical ecology and the value of managed areas: Managed areas are designed to manage priority natural and social resources. The species that are the targets for management will have specific needs and behaviors that must be

taken into consideration in the design of the management approach. For example, if you want to protect grouper, you must be sure to properly manage grouper habitat for various stages of the grouper life cycle. Many managers and officials may not have a good understanding of basic tropical ecology. But it is important for them to understand the basics of tropical ecology so they can make informed decisions in regards to management activities. A thorough Awareness Program on tropical ecology and the benefits of managed areas may be necessary if community members are highly resistant to continuing the managed area or planning for its improved management.

- Provide education and awareness on climate change: It is critical to provide up-to date regional information about climate change to community leaders and members to provide them with accurate predictions so that they can take action and get involved in climate change adaptation planning in a meaningful way. Climate science is rapidly evolving and becoming more specific to the regional and site level. It is important for the planning team to gather and review the best available information for the purposes of adaptation planning. This information should include: What is climate change? What are the most up to date climate change predictions for the region (i.e. regarding precipitation, sea level rise, storm frequency and intensity, sea surface temperature, etc)? Why should the community care about it and get involved? What are the potential impacts to the community and the resources they depend on? How does climate change relate to other threats or problems they may be facing in their community? What can they do to prepare for climate change? What is the adaptation planning process look like and how can they be engaged in it? If possible, it is recommended to use the "Adapting to a Changing Climate Outreach Toolkit" developed specifically for outreach and awareness of Micronesian communities.

Exercise Four: PROVIDING BACKGROUND ON THE LOCALLY MANAGED AREA AND MANAGEMENT AND ADAPTATION PLANNING FOR COMMUNITY PARTICIPANTS

A. Exercise Purpose

This exercise will cover:

- Discussing reasons for creating a locally managed area
- Reviewing locally managed area activities to date
- Reviewing the management and adaptation planning process

As mentioned, by the time you are ready to start management and adaptation planning, you will most likely have already undertaken a lot of activities in your community. It will be very helpful to cover this information with the community members. They should clearly understand why the locally managed area was created and what has been done to date. They should also clearly understand general background information on the process that will be used to create the

management and adaptation plan. Within this they should understand the role that the community will play and the role that a planning team and others will play.

B. Facilitation Suggestions

The way that you present this material will be highly dependent on the specific site.

If for example, there was very good community participation in the creation of the locally managed area, you may choose to discuss the reasons for creating the site by asking community members to contribute their thoughts.. Or if fewer people at the meeting are familiar with the history of the site, you may simply want to present the material. If you are unsure, we recommend covering this information simply through presentation as this is the first session with the community and it may take a while for people to get warmed up.

Activities that have been undertaken at the locally managed area thus far may be best presented in a timeline. We have found using an LCD projector or flip chart paper and simply showing a timeline of the activities is very helpful.

To share the background information on management and adaptation planning and the process, you can easily create a short presentation from the material presented in the INTRODUCTION TO MANAGEMENT AND ADAPTATION PLANNING – BACKGROUND INFORMATION section of this guide. We recommend that rather than presenting all the material you focus on the definition of the terms "management and adaptation plan", the benefits of management and adaptation planning, and the characteristics of a good management and adaptation plan. At this early stage, community members do not necessarily need to know about the details of the table of contents and other aspects of management and adaptation plan.

You can then use the flow chart that summarizes the management and adaptation planning process steps to illustrate to community members the process that they will go through together. Be sure to always highlight which steps will include community participation and which steps will be carried out primarily by a planning team. Also, at the beginning of each meeting be sure to summarize what steps in the process have already been carried out and illustrate what steps still need to be carried out. At the end of the meeting, again review where you are in the planning process and be sure to discuss what steps will follow.

C. Background Information for Facilitators

The best background information to use for this exercise are:

1. Any documents or verbal summation as to the reasons for the creation of the locally managed area.
2. Any reports or other documentation that summarizes the history of activities that have occurred at the locally managed area.
3. The background information on management and adaptation plans provided in the introduction section of this guide.

4. The flow chart that show the management and adaptation planning process also provided in the introduction section of this guide.

D. Worksheets

There are no worksheets for this exercise. You simply will create a presentation either digitally to be projected on an LCD projector or with a series of flip charts. It's helpful to make flip charts as these can be posted around the room during the entire meeting so that people can to refer to them later.

Exercise Five: Providing Awareness of Tropical Island Ecology

A. Exercise Purpose

Before launching into a management and adaptation planning process for a tropical managed area, be sure that planning team members and stakeholders have a good understanding of basic concepts in tropical ecology. There are many managed areas around the world that have been inadvertently or purposely-sited in ecologically inappropriate areas. The result is that these areas will never produce the benefits that were originally hoped for. For example, if one objectives of an managed is to improve fishing for key coral reef species, the managed area must be sited in an area that will produce coral reef fish and allow for spill-over. If grouper or parrotfish are an important fishing target, the area should not be placed exclusively in seagrass or sand flat habitat. These areas simply do not provide habitat for adult grouper and parrotfish. The best design would include a range of coral reef areas and associated habitats to cover the full life history of key species. Some mangrove area would be protected, some seagrass beds, some sand flat, some reef flat, and some reef slope. Biologists can help identify which areas are likely to produce which results based on the ecology of the area. Planning team members should understand that this type of ecological advice is important to designing the managed area. If it is not taken into consideration, the managed area may not yield what you are looking for.

Many projects will include Information, Education, and Communication (IEC) Campaigns on tropical ecology as a key part of their community engagement strategy. As a result, your project may have already carried out considerable background teaching on tropical ecology. This is great; however, it is still important to go over some key concepts with the community and your planning team so the information will be fresh in their minds as they move forward to create a management and adaptation plan for the locally managed area. Some of these concepts are provided in the background for facilitator's section.

As mentioned above, in many cases, the community may have undergone outreach activities or have extensive traditional and/or local knowledge about ecological systems. If you find that you are working with a community that needs more outreach prior to planning, you may want to tailor your information based on the level of existing knowledge. In this case, you can use socio-economic assessments to help understand level of knowledge, attitude, and perceptions of community members about tropical ecology, climate change, concerns about priority targets and threats, and other factors important for management planning. Results from socio-economic assessments can then inform your outreach program. Tools such as SEM-Pasifika can be used to design these socio-economic assessments.

B. Facilitation Suggestions

This session is intended to be more of a discussion than a working session. Depending on the experience and knowledge of your group, we suggest that you pursue one of two facilitation approaches:

1. If your group has very little knowledge of tropical ecology, you may simply want to present the information in the "Background Information" section below and encourage a discussion of these key factors relative to your site.

2. If your group has more experience in tropical ecology, it would be good to provide them with basic introduction on the topic before having them fill out the worksheet below. After this you can discuss the findings as a group, help the participants fill in any missing concepts, and identify any other factors they should consider. You could ask teams of two to fill out the worksheet and then hold a discussion about their findings. You can then fill in any important factors they have not identified.

C. Background Information for Facilitators

As any management and adaptation planning team considers a management and adaptation plan, zoning, and regulation system, it is important to review some basic facts about the ecology of tropical coral reef ecosystems. If possible a full education component on tropical island ecology should be carried out before the management and adaptation planning process begins. The following information just provides a brief summary of the types or key information that participants should be provided through a thorough education component.

This type of information will help guide decisions as to what types of activities and zones to pursue and where to put them.

1. Each species depends on a particular habitat for its survival. Likewise, the habitat needs of key species may change during certain parts of their lives or even during times of day and in different seasons. For example, some fish may spawn in the mangroves, feed in the sea grass, and rest and hide in the coral area. As a result, it is critical that the management and adaptation planning and zoning process help to ensure that all the key habitats of each target species are well managed.

2. In addition, to identifying areas of good habitat to include in management, it is important to identify areas where there is a good standing stock of target species. The population of a species can only recover if it can reproduce. Good reproduction depends on there being enough reproductive age individuals in close proximity to one another so they can spawn. Some species such as grouper come together in spawning aggregations so these areas should always be protected. Other species such as sea cucumbers, giant clams, trochus, and many species of fish simply need to be close enough to other individuals to reproduce. Areas with good standing stock should be well managed.

3. Most coral reef fish species such as grouper and snapper grow slowly and only reproduce after approximately five years of life. As a result, they depend on long life and many years of reproduction to keep their population high or stable. As a result, larger older fish should be allowed to stay on the reef. These are the fish that are most reproductive and therefore play the largest role in maintaining the local population of their species.

4. As a result, coral reef fish species are not good targets for intensive commercial-scale harvest. If reproductive age fish are taken off the reef through intensive fishing the population will usually will crash and sometimes cannot recover.

5. Most reefs include important areas for spawning aggregations that become established over many years. It appears that young fish learn where to aggregate by watching older fish. As a result, if these areas are over-fished, it is possible that the aggregations will not recover. It is therefore important to manage fishing of aggregations very carefully.

6. Ideally, fish should not be harvested during their aggregation times so they are allowed to reproduce without disturbance.

7. Larger fish are older and produce many times more eggs than small or medium-size fish. For example, a 24 inch-jack produces almost 4.3 million eggs, while a 12-inch jack only produces 49,000 eggs. As a result, the larger fish is worth 87 of the smaller fish in terms of egg production and reproductive output.

8. It is believed by fisheries scientists that older, larger fish not only produce more larvae but also produce larvae that are healthier and more likely to survive.

9. In summary, large fish are extremely important because they produce more eggs, healthier larvae, and show younger fish where to aggregate. As a result, fishing regulations should restrict the taking of large individuals and instead focus on intermediate-size individuals.

10. After having been caught and released, a high percentage fish die. As a result, even when targeting intermediate-size fish, it is important to use specific gear such as spears rather than nets or hook and line. Catch and release is typically not an effective management tool for coral reef fish.

11. Pelagic species (such as tuna and mahi mahi) grow quickly and reproduce at about two years of age. This is why they can handle more intensive harvesting and still have sustainable populations.

12. Corals can be killed when the sea surface temperature becomes too high. This is known as bleaching. Widespread and damaging bleaching occurred in Micronesia in 1997 and 1998.

13. However, some areas of coral reefs tend to recover from bleaching more quickly because unique currents, upwelling of cool water, or some other feature enables them to recover.

14. If bleaching occurs and fish populations are too low, algae can over take the coral, thus preventing recovery. As a result, healthy numbers of fish when coral bleaching occurs.

15. Any zoning system should attempt to include areas that have recovered well from bleaching and include these in management.

16. Corals, sea grass, and other species can also be killed when there is too much sediment or other pollution in the water. Land-based sources of pollution are often one of the most serious threats to marine managed areas and are often one of the most difficult to address. If possible, it is important to manage some areas that are not seriously threatened by land-based sources of pollution. This may include areas that are far from land or that experience consistent flushing of pollution. Of course, pollution should be addressed like any threat but given how challenging it is to address sedimentation and other pollution issues, managers must also consider protecting areas that are less affected by these threats.

17. No-take areas tend to have high numbers of fish as they are allowed to grow and reproduce without disturbance. If the numbers are high enough, some fish often will move to areas adjacent to the no-take zone. This is known as “spill-over”. As a result, the fishing on the edge of no-take zones is usually very good.

18. Because fish move around on the reef, it is a good idea to put a buffer zone around no-take zones where only a little fishing is allowed. This will allow fish who live in the no-take zone to move around without being caught.

19. Zoning systems should take into consideration the idea of spill-over and may want to place fishing zones near the buffer zone of the no-take area. These areas will tend to yield really good fishing; because of the buffer zone, the fishing will not have a major impact on the populations of fish in the no-take zone.

20. The larvae of corals, fish, and other species travel in the water with the prevailing currents. As a result, one area may be a source of larvae while another area receives larvae. It's important to try to understand how the currents around a reef work so that your zoning system can protect the areas that are sources for larvae and the areas that receive larvae. If you only protect areas that receive larvae, eventually the source will be overused and destroyed, the area you have protected will have no source for larvae, and it will decline as well. Understanding these relationships involves very complex science, but managed areas should do their best to understand the currents. They should also protect many areas around the reef so that they have a good chance of including both source areas and receiving areas in the zoning system.

21. Protecting healthy areas with good habitat, a good standing stock of target species, and fewer threats will yield the fastest results in terms of increases in populations of key species. This will also yield the fastest results in terms of spill over and increased fisheries benefits. Protecting less healthy areas that don't have good habitat or standing stock simply means it may be much much longer before you see any real benefits.

22. Fisherman typically want to retain access to their best fishing grounds. This is completely understandable as in many areas fish are an important source of livelihood and/or recreation. However, in many cases the best fishing grounds are also the areas where there is the best habitat and possibly the best remaining population of key species. As a result, fishermen must consider possibly protecting some of their best fishing grounds if they want to gain fisheries benefits from increase populations.

23. If good habitat areas for target species are not included in management, it is less likely for these species to recover. As a result, you may not benefit as quickly or as fully in terms of increased populations as you would if you include some very good habitat in protection. While there is no magic formula to predict the benefits you will gain from including good habitat, we do know that you have a much high probability of benefiting if you include appropriate high quality habitat than if you do not.

24. Fisherman typically want to retain access to their best fishing grounds. This is completely understandable as in many areas fish are an important source of livelihood and/or recreation. However, in many cases the best fishing grounds are also the areas where there is the best habitat and possibly the best remaining population of key species. As a result, fishermen

must consider possibly managing some of their best fishing grounds if they want to gain fisheries benefits from increase populations.

25. If good habitat areas for target species are not included in management, it is less likely for these species to recover. As a result, you may not benefit as quickly or as fully in terms of increased populations as you would if you include some very good habitat in protection. While there is no magic formula to predict the benefits you will gain from including good habitat, we do know that you have a much high probability of benefiting if you include appropriate high quality habitat than if you do not.

26. We suggest that a thorough mapping and assessment process be carried out before zones and regulations are finalized. The assessment and mapping process will identify and document the location and condition of key habitats and the presence or absence of key species. Anecdotal information about where key species exist and are productive can also be important to completing the picture gained through the assessment process. This process will help to identify the areas that are most likely to yield the greatest benefits quickly. The zones that are chosen should work to protect the key habitats of target species.

27. Any Management and adaptation planning process that includes zoning and rule making will require negotiation. The process must provide solid scientifically valid advice to help decision makers make informed decisions. However, social considerations such as subsistence and income must come into play. Ultimately zoning will be a process of negotiation and compromise but it is absolutely critical that participants have very good information so they can understand how their choices in terms of zones are likely to affect the ultimate success of the locally managed area.

D. Worksheets

1) If your participants have basic knowledge in tropical ecology, ask them to fill out the worksheet below.

2) Discuss participants' results, and ask them to fill in any information they have not identified.

3) Based on the results, you can determine which concepts you need to teach them in basic tropical island ecology. Understanding these concepts will help them when they work to develop the management and adaptation plan.

1. Please describe the primary habitat types that comprise your community and locally managed area (in the next Exercise you will map these).	

2. Are coral reef species a primary target of your conservation effort? If so, later we will identify key habitats for your target species	
3. Do you have spawning aggregation sites in your locally managed area?	
4. Do you have an understanding of the prevailing currents in your community? Please describe.	
5. Do you have a good understanding of where key species are abundant? If so we will map these areas later to help us determine which areas are good candidates for management.	
6. Have the corals in your area experienced bleaching? Please provide detail	
7. Do you have a good understanding of the condition of the various habitats in your area? Please explain	
8. Are there any topics about the basic ecology of your area that you feel you need to understand better? Please explain	

Exercise Six: Providing Awareness of Climate Change and Climate Variability

A. Exercise Purpose

In addition to understanding tropical island ecology, community members should have a basic understanding of climate change and climate variability including predictions for the region and potential impacts to the community natural and social resources. As such, some time should be taken to ensure that community leaders and members have sufficient information about likely future scenarios to make informed decisions about adaptation planning.

Because climate change science is changing so rapidly it is important for the planning team to do some research prior to working with communities to ensure that the most up to date science is reflected in the outreach. While there are still many questions about specifically how the climate variability and change within a region will occur, there are some facts that can be presented and discussed with community members.

B. Facilitation Suggestions

Like the tropical ecology session, this session is intended to be more of a discussion than a working session. Because climate change is a relatively new field it is likely that many people do not have a good understanding of climate change and variability. Therefore it may be best to present the information in the "Background Information" section below and encourage a discussion of these key factors relative to your site. Future exercises will draw out community perceptions, knowledge and experience with climate change events and impacts.

C. Background Information for Facilitators

As a planning team considers management and adaptation planning, zoning, and regulation systems, it is important to review some basic facts about climate change and predictions for Micronesia. If possible a full education component on climate change should be carried out before the management and adaptation planning process begins. Ideally, this would be done using the "Adapting to a Changing Climate" Outreach toolkit developed for Micronesia. The following information provides a brief summary of the types of key information that participants should be provided through an education component.

What is climate change and climate variability?

- Climate Change is not new.
    - It's been happening forever but recent events are shifting the speed at which it is occurring
    - Many of the Impacts of climate change will be seen in the long term (50+ years) while others may be noticed sooner.

- Causes of Climate Change

- There are gases that given off by various human and non-human activities that trap heat in the atmosphere. These gases are called greenhouse gases and include carbon dioxide, methane, and nitrous oxide. Human activities that create these gases include the use of fossil fuel burning for things like cars, planes, electricity as well as agricultural activities.
- However, human made gases have increased significantly over the past 200+ years from the increased use of fossil fuels and land use changes, especially in the developed world.
- There is an Intergovernmental Panel on Climate Change (IPCC) that includes scientists from around the world who have conducted independent studies about causes of increased rates of climate change. Those studies have been compiled into a large report in 2007. IPCC scientists agree that "Global atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values…..The global increases in carbon dioxide concentration are due primarily to fossil fuel use and land use change, while those of methane and nitrous oxide are primarily due to agriculture." (IPCC, 2007)*
- These increased gases in the atmosphere are causing faster increase in the temperatures of the atmosphere than what would occur naturally.
- Increased atmospheric temperatures will have many other impacts to climate and weather patterns globally.

- Climate Variability:
  - While many climate change impacts may not be noticed for several years, there will likely be shorter-term changes to average weather patterns (annual rainfall, air temperature) that may be noticed sooner. The shorter-term changes in weather patterns are called "climate variability".
  - In Micronesia, short term changes in weather are very dependent on El Nino/ La Nina events

What is El Nino/La Nina?

- El Nino/La Nina occur when there is a change in the normal air/ocean interactions in the Pacific Ocean.
- During an El Nino event winds that normally blow west slow down. These winds normally keep the warm ocean surface current toward the Western Pacific ocean. However this current moves east during El Nino which effects weather patterns globally. In Micronesia, El Nino generally causes less rain (drought) but increases likelihood of storms, and warmer air and sea surface temperatures. It can last 2-4 years and can happen every 2-7 years apart.
- El Nino is usually followed by La Nina when the western winds blow again and push the warmer ocean surface current further to the Western Pacific. In Micronesia, weather patterns during La Nina generally have more rain, less storms, and cooler air and sea surface temperatures.
- It is unclear how climate change will impact El Nino and La Nina events and if they will become more or less frequent and severe. Scientists are not yet able to predict when an El Nino event will occur but when an event begins, they can predict the general weather/climate conditions for the 7-9 months.
- However - It is **very important** to know if these events are occurring on any given year as it can help a community prepare for impacts from these climate events such as drought and/or flooding.

Resources on ENSO: http://www.pmel.noaa.gov/tao/elnino/nino_normal.html

What changes can we expect to see in the region and in our community?

- What does the science say?
  - We discussed the causes of climate change previously and how the international community has studied and agreed why these changes are occurring (from human activity)
  - There are also studies happening in Micronesia and scientists reviewing information for this region to try to understand how climate change will impact this region. However, it is still not known "exactly" what will happen to any region, country, or community.
  - Information presented here provides some information about what we know will happen, what is likely to occur, and what we don't know about changes to climate and its impacts in Micronesia:
    - Sea surface Temperature is increasing
    - Sea Level Rise is increasing:
      - According to Vermeer at al (2009), even for the lowest emission scenario in the IPCC , sea-level rise is then likely to be 1 meter; for the

highest, it may even come closer to 2 meter by the end of this century (or by 2100).**

- Air Temperature is increasing:
  - According to different emission scenarios in the Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report (2007) , the average rate of the global temperature rises by the year 2100 ranges from 2 to 4.6 °C.*
  - For the next two decades, a warming of about 0.2°C per decade is projected for a range emission scenarios (IPCC 2007).*

- Acidity of the Ocean is increasing

Change in weather patterns:

- Storm events are not predictable at this time. Will there be more or less? Will they be bigger or smaller? Will they be stronger or weaker? We cannot answer any of these with any reasonable certainty. However as sea level rise increases – any storm events that occur could bring great storm surges.
- Change in Rainfall Pattern – There is evidence that conditions in some locations (e.g. Marshall Islands) are getting less rainfall. What we don't know, if this is part of a normal cycle (part of natural variability) or actually a result of global climate change.
- Based on a range of models, it is likely that future tropical cyclones (typhoons and hurricanes) will become more intense, with larger peak wind speeds and more heavy precipitation associated with ongoing increases of tropical sea surface temperatures. There is less confidence in projections of a global decrease in numbers of tropical cyclones.

* Source: Intergovernmental Panel on Climate Change. 2007. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Eds Solomon S, et al. Cambridge University Press, Cambridge, United Kingdom.

**Martin and Stefan Rahmstorf. 2009.Global sea level linked to global temperature. Proceedings of the National Academy of Science of the United States of America. 2009 December 22; 106(51): 21527–21532. Published online 2009 December 7. doi: 10.1073/pnas.0907765106.

How will those changes impact our community?

- Now that we know more about what changes we are likely to see from climate change and climate variability in Micronesia we can look at the potential impacts these changes may have on our community.

  - Increased sea surface temperature can cause →
    - coral bleaching which can make corals weak or die and result in →
    - loss of habitat and nursery ground and loss of fisheries causing →
    - a loss of food and/or income for community members who are dependent of fisheries.

- Increased sea level rise can cause →
  - Stronger storm surges, flooding, inundation, and coastal erosion which can cause →
  - A loss of crops and homes. This leads to →
  - Health hazards, a loss of food, and decrease of land for living

- Changes in Rainfall can cause →
  - Droughts if it's decreased or OR flooding/inundation/ landslides if increased which cause →
  - a loss of crops and homes and causes →
  - a decrease health, and loss of food for community members

- Increased Air Temperature can cause →
  - increased stress on plants/crops and people (especially old) which can cause →
  - a loss of food or a health hazard

- Increased Acidity of the Ocean can cause →
  - coral bleaching which can make corals weak or die and result in →
  - loss of habitat and nursery ground and loss of fisheries causing →
  - a loss of food and/or income for community members who are dependent of fisheries.

Cumulative impacts:

- Cumulative impacts are the comprehensive effect on the environment that results from the incremental impact of past, present, and reasonably foreseeable future actions.
- Therefore the more threats that are occurring in an area the harder it is for resources and communities to recover from predicted changes..
- Climate change will have a greater impact on natural resources that are under numerous threats than those that are healthy.
- For example: A coral reef that is threatened by sediment, and over-fishing of herbivores will be less likely able to withstand sea surface temperatures warming because they are already very stressed. They are more likely to bleach and/or die. Where coral dies, it will be hard to grow new corals because of sediment on the structures and overgrowth of algae (because no herbivores are there to eat the algae). The cumulative impacts are sediment, over-fishing, and ocean warming. A healthy reef system will also be stressed from warmer sea surface temperatures and may also bleach or die. HOWEVER, it is more likely to recover from this warming because it is stronger (more resilient). Where there is coral death, it will not be overgrown with algae because it has fish eating the algae and no sediment on it. Therefore new corals "recruits" can establish and grow.

How can we understand how climate change will impact our community?

It is important for community members to understand what the concept of vulnerability means before carrying out the vulnerability assessment. It is less important for the community to fully understand the specific terms. Key concepts and definitions to review to prepare for the vulnerability assessment exercise are presented below. Ideally the facilitator can utilize the "climate change outreach toolkit" to demonstrate these concepts visually.

Vulnerability: is 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 exposure, sensitivity to climate impacts and related adaptive capacity.

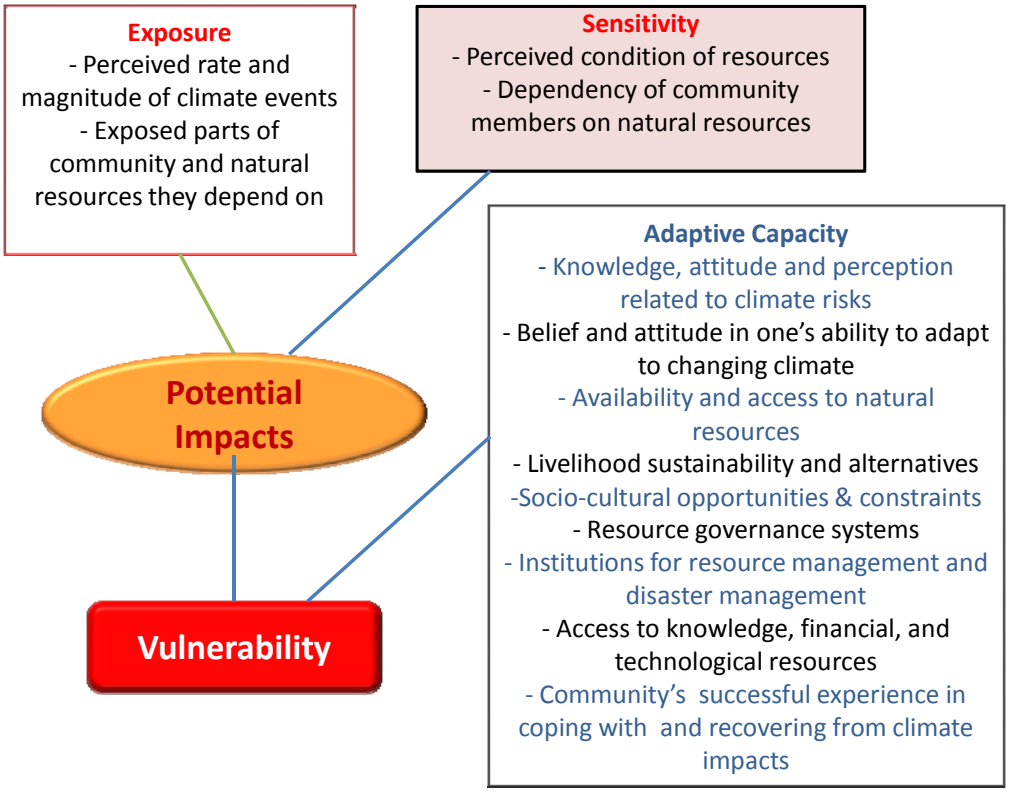
Exposure: the extent to which a system comes into contact with climate conditions or specific climate impacts.

Sensitivity: the degree to which a built, natural, or human system is negatively affected by changes in climate conditions (e.g., temperature and precipitation) or specific climate change impacts (e.g., sea level rise, increased sea surface temperature).

Potential Impact: The more exposed and sensitive a resource is, the greater the potential impact will be from climate change threats. For example, agriculture is close to shore and the crop cannot survive with salt water spray (exposure and sensitivity are high) – the potential negative impact from sea level rise is greater than a crop that is further inland and/or can tolerate salt water spray.

Adaptive capacity: potential, capability, or ability of built, natural, and human systems to adapt to impacts of climate change and variability with minimal potential damage or cost.

Resilience: ecological and social capacity to cope with, adjust to and recover from external stresses and disturbances. It is the flip side of vulnerability. Therefore, if you increase resilience of a community or resources, you will decrease their vulnerability.


Exposure
- Perceived rate and magnitude of climate events
- Exposed parts of community and natural resources they depend on
Sensitivity
- Perceived condition of resources
- Dependency of community members on natural resources
Adaptive Capacity
- Knowledge, attitude and perception related to climate risks
- Belief and attitude in one's ability to adapt to changing climate
- Availability and access to natural resources
- Livelihood sustainability and alternatives
-Socio-cultural opportunities & constraints
- Resource governance systems
- Institutions for resource management and disaster management
- Access to knowledge, financial, and technological resources
- Community's successful experience in coping with and recovering from climate impacts
Potential Impacts
Vulnerability

STEP THREE: ORIENTING THE COMMUNITY: WHAT'S HAPPENING IN OUR COMMUNITY AND WHAT'S IMPORTANT TO US?

This step should be carried out through several community/stakeholder meetings or activities. The Step will cover:

- Mapping the Community and its Resources (social and biological)
- Biological and Social Baseline Assessments
- Historical and Projected Timeline
- Seasonal Calendar
- Transect Walk
- Identifying, Prioritizing, and Mapping Natural and Social Resource Targets

Several meetings or activities will be held with the community/stakeholders to carry out the following:

- Map the key features of the site and the surrounding area: At this stage the map should just help to illustrate the area and show the main infrastructure, habitats, important areas for key species, and social features. This map will be used in later exercises so should be as accurate as possible. It will be field validated later.

- Carry out Social and Biological Assessments – Some of this work may have been done already and can be reviewed during this step. If it has not been done, it is ideal to conduct both a socio-economic assessment of community members and a biological assessment of the natural resources. Socio-economic assessments can provide you with key baseline information about the community members knowledge, attitude, and perceptions of local resources, changes over time, and support for management activities. It can also provide important information related to dependency on the resources, and diversity of income generation which can provide key insights for adaptation planning. Additionally, biological assessment provide the planning team with a baseline understanding on the status and location of the natural resources to support planning decisions. Both of the assessments can be repeated over time in monitoring programs to track changes based on management efforts.

- Develop a historical and projected Timeline: This exercise will help the community get a historical perspective on past climate events and how they impacted the community. With this review of historical events and the knowledge of climate predictions, the community gains insights into how future climate changes may impact the area as well as how they may be able to best prepare for and cope with those changes.

- Develop a seasonal calendar: This exercise will provide a visual annual timeline that gathers information about when certain weather patterns normally occur, and what seasonal events (fruiting seasons) or biological events (e.g. spawning aggregations) are associated with specific times of year. This information will be useful to identify changes in normal

seasonal patterns that may or may not be associated with climate change and to consider future climate scenarios and their impacts on seasonal events.

- Carry out a transect walk: This can be done as part of the other exercises or separately. However, it is important at some point to physically walk through the community from end to end, to review the community map and it's accuracy on where important infrastructure, natural resource and social are located. Also to review areas that have been or are likely to be impacted from past or future climate events.

- Identify, prioritize, and map your natural and social resource targets: Next stakeholders should prioritize their top natural and social Resource targets and focus on the top targets for the management and adaptation planning process. If the targets that are identified are not already on the map, they should be put onto the map.

Exercise Seven: MAPPING YOUR SITE AND SURROUNDING AREA

A. Exercise Purpose

This exercise provides a simple set of steps for making maps of your community and/or locally managed area. The mapping process is an excellent way to get community members involved in the management and adaptation planning process. People generally really enjoy the mapping process.

This first map will be a general perception map about the community area. It should cover the entire area where the community has some role or where they access resources. We suggest that you don't just focus on the a specific site such as an marine managed area on this initial map but that you include the community area, the location of houses and farms, the adjacent land and water area. You want to include enough area to be sure that can understand your resources and threats as much as possible.

This map will form the foundation future exercises so it should include as much information as possible.

The maps will include the following:

- Important natural and cultural resources such as main habitat types (e.g. forest, mangrove, seagrass, coral reef, sakau farms, taro patches, etc)
- Threats and the sources of those threats (forest clearing, point sources of pollution, illegal fishing, etc.)
- Social activities
- Economic activities such as areas important for income generation (e.g. fishing/ gathering spots, agriculture, local businesses)
- Infrastructure such as roads, bridges, community facilities, evacuation routes
- Some information about the adjacent communities if it seems relevant.

The location of these elements can be approximated and drawn on maps to provide participants a much better understanding of the spatial relationship between resources and threats. You should try to draw things with some sort of relative scale but don't worry too much about being exact. You will have future opportunities to draw exacting maps with GPS and GIS in the future. For future zoning, it will be helpful if precise locations identified using GPS and then put on a geo-referenced map using GIS software. If however, resources are not available for this, landmarks and other mapping techniques can substitute for the high tech options.

B. Facilitation Suggestion

The facilitators can prepare an outline of the boundaries of the community that will be mapped. This will help to guide the group and make sure the map contains all the areas and information that you feel is important. We suggest that the map be on a large sheet of paper (two or more flip charts taped together) and that the mapping be carried out on a large table. Some groups have tried to do the mapping on a vertical surface and have found it more challenging then those that do it on a table. You should have several colors of marker available and also some crayons can come in handy.
Be sure that the group is making a legend as they go.

C. Background Information for Facilitators

Some community members may not be familiar with mapping and mapping processes. As possible be sure that members of your facilitation team work with individuals that seem to be struggling. Try to make sure that everyone present gets a chance to contribute his or her knowledge.

D. Worksheets

As you prepare your map be sure to answer the following key questions.

1. What are and where are the key habitats within your community area? Include terrestrial, aquatic, and marine habitats?

2. Are there areas that are important for key species (e.g. turtle nesting beaches, dugong feeding areas, bird nesting areas, spawning aggregations)? Please list.

3. Please identify the areas of varying habitat quality (e.g. good reef areas, damaged reef, healthy streams, polluted streams, clear water, turbid water, etc.).

4. Are there important cultural features such as fishing shrines, house sites, fishponds, etc.? Please list.

5. Where are the main infrastructural elements such as roads, pubic buildings, schools, evacuation routes, water reservoirs or tanks, etc.?

6. Where are the key social and economic activities carried out in your locally managed area (farming, fishing, harvesting, boating, diving, snorkeling, and other)?

7. Where are different types of fishing gear used?

8. Please include any other features that you feel are important to your community and should be included on the map

Exercise Eight: BASELINE BIOLOGICAL ASSESSMENTS

A. Exercise Purpose

The purpose of this exercise is to provide some basic information on the importance of undertaking baseline biological assessments and help planning teams develop and pursue a plan for undertaking a baseline biological assessment. This section does not provide detail description of biological assessment methodologies as there are several guidance document that are tailored to provide this specific information.

This section provides:

- A Brief Overview of the Importance of Carrying Out a Baseline Biological Assessment Prior to Management and Adaptation planning
- General Suggestions as to How to Facilitate the Design of a Biological Assessment
- General Suggestions for Potential Survey Objectives and Baseline Indicators.

The Importance of Carrying out Baseline Assessments: A baseline biological assessment is a broad term for capturing biological information at or toward the beginning of a project or before a new intervention is pursued. This information can be used for both for planning and for monitoring. Most baseline assessments are designed to help practitioners understand the extent and condition of key habitats as well as the presence or absence and population levels of key species. The assessment process can also provide important information about ongoing threats to these priority resources. Understanding the condition of key natural resources can provide important understand vulnerability of these resources. If for example, a coral reef is extremely degraded due to sediment and blast fishing the coral animals themselves may be stressed and less likely to resist or recover from bleaching events. These degraded corals tend to be more sensitive to climate change impacts and therefore may contribute to the vulnerability of the entire ecosystem. Additionally, biological information can be assessed again in the future to determine if changes have occurred over time and if vulnerability is increasing or decreasing. While it is often difficult to tell if management actions have been directly responsible for improvements in the condition of key resources; having a baseline and periodically comparing the condition of resources can help practitioners to understand if more or different actions are needed.

B. Facilitation Suggestion

It is recommended that facilitators first identify those individuals on the planning team or in the community that are interested in biological assessment and monitoring. It is also important to identify resource people from other stakeholder groups such as government, NGOs, ore local universities that may serve as technical support to the process. This team can help to develop the assessment plan. The facilitator can guide this team through a number of steps that will help to develop the baseline assessment plan. A template for developing this plan is provided in section D. Worksheets.

Steps to developing the plan:

1. Identify the target area to be assessed and/or monitored.
2. Review what biological assessment work has been done for the area and develop your plan accordingly. Depending on the objectives and indicators that you develop, you may find that you primarily have to fill in gaps or you may find that an entire new design is required.
3. Define assessment objectives. Some ideas on potential objectives and indicators are provide in section C: Background Information for Facilitators. In summary, the objectives of the assessment will dictate the extent, rigor, and costs of the assessment design. If for example you want to understand the full biodiversity of the corals and fish of an area you will need to engage taxonomic experts to help design and carry out the assessment. Globally there are relatively few individuals with a high level of taxonomic expertise. So chances are you will have to plan long in advance and contract these individuals. If however, you want to know primarily about the condition of key target species, you may be able to design and carry out the assessment with a lower level of scientific expertise.
4. Define priority natural resources (target habitats and species) to be included in the assessment. Generally these will at a minimum include priority resource targets. However, it may also be important to include other biological indicator species or associated habitats that are important to the overall health of the ecosystem.

5. Indentify indicators related to the assessment objectives Ensure that the data you collect will turn into information that is useful for your management and adaptation planning
6. Form your final assessment team. Your team thus far has probably been primarily made up of practitioners involved in the site. At this stage, you may need to expand your team to get the kind of expertise you need. The individuals that will need to be on this team will largely be dictated by the degree of rigor in marine science or traditional knowledge that is needed.
7. Select data collecting methods that are appropriate to collect the data on your indicators and are possible with your team capacity. Keep in mind that subsequent monitoring should use the same methods so that data can be compared over time. There are numerous guides to biological assessment and monitoring that can provide guidance on methods appropriate for different levels of capacity.
8. Prepare the details of the assessment including: develop the work plan, identifying and securing the equipment that will be needed, assigning responsibilities, and developing and securing the necessary budget.
9. Analyze and interpret collected data. If is recommended that you present the data back to the community, from who you collected the data, to inform them of and validate your findings. Make sure that you meet the objectives of your assessment.
10. Communicate your results. Develop a communication plan, specifying your target audience, communications purpose, means to reach and communicate with them, schedule, people in charge, and communication product which may include reports, summary sheets, presentation slides, posters, etc.
11. Use key biological assessment information to help plan your interventions or adapt your management. For example if you find an important spawning area or mangrove is degraded, design a management action that will help to protect and restore it. Whenever possible, integrate the biological monitoring results with socio-economic results, and draw conclusion that integrates learning and lessons from different types of data sets.

C. **Background Information for Facilitators**

Developing and executing an assessment plan and a related monitoring plan The requires a good understanding of scientific methods and key assessment skills.
An assessment and monitoring advisor with prior experience should definitely be secured to assist any Locally Managed Area project. Below we provide a short summary of potential objectives and indicators for biological assessment. However, to develop the full approach and plan, the team should seek guidance both from more extensive guides and advisors.

Objectives for assessment and monitoring should directly reflect the objectives of the Locally Managed Area project overall. If for example, the project is devoted to conserving biological diversity, it is important to design assessment approaches that allow practitioners to understand biological diversity. This would include absence and presence of species; species number in particular taxa, endemism, and other biodiversity features as appropriate. If a project is more interested in restoring populations of species that are important for fisheries, it would be more appropriate to measure population and range of these species as well as habitats that are important to their life history.

Some examples based on focal areas of for LMA conservation projects

I. Ecosystem Conservation

Possible Objective: Understanding Health of Ecosystems (including changes over time)

Potential Indicators: List of key natural ecosystems, distribution and extent of key ecosystems (including historical extent), condition of key habitats (such as level of degradation), water quality. Changes over time may be best identified through historical records and/or community and traditional knowledge.

II. Biological Diversity

Possible Objective: Understanding status of biodiversity (including changes over time).

Potential Indicators: Species number, Presence/absence of species in key taxa, Endemism, Changes in species presence/absence over time.

III. Socio-economically Important Species

Possible Objective: Understand the status and trends in key species that have been identified as important socio-economically (including changes over time).

Potential Indicators: Population of key species, range of key species, location and condition of important life history areas. Associated socio-economic indicators may include catch per unit effort of key species and dependency on these species.

IV. Biologically Important Species and Feeding Guilds

Possible Objective: Understand the status and trends in key species and feeding guilds that have been identified as biologically important (including changes over time). Examples include herbivorous fish that may help to prevent algae from taking over corals after bleaching, mid-level, and top predators, coralivorous species, and others.

Potential Indicators: Population of key species, range of key species, location and condition of important life history areas. Associated socio-economic indicators may include catch per unit effort of key species and dependency on these species.

V. Habitat Representation

Possible Objective: Understand the status of key habitats and representation of these habitats in management.

Potential Indicators: Distribution of key habitats, current and past extent of habitats, current habitat quality.

V. Ecosystem Resiliency Features

Potential Objectives: Understand location and condition of key features that may offer resiliency to climate change. Examples include: upwelling of cool water, areas of strong current and flushing. areas of heat adapted corals.

Potential Indicators: Location and condition of key resiliency features

VI. Important Biological Features including: Rare or Endangered Species, Important Life History Areas, Migration Routes, etc.

Possible Objective: Understand Status Areas for Spawning, feeding etc.

Potential Indicators: Populations of rare and endangered species, location of important migration routes and populations of migratory species, spawning area locations, populations of spawning species including change over time

Finally, a biological assessment should consider the following questions during design and analysis to understand climate change impacts over time:

- Which natural resources have been impacted by past climate events?
- Have you notice unusual patterns in natural resources after a climate event (e.g. bleaching, COTs outbreak, invasive species)?
- How have these target resources recovered from climate events?

D. Worksheet

Template for Biological Assessment Plan

Key Question	Answer
Target Area	
Summary of Previous Assessment work	
Priority Natural Resources	
Assessment Objectives with Indicators	
Assessment Team member with expertise	
Data collection methods	
Activity Timeline (develop on separate calendar format)	
Equipment and supplies needed	
Budget and sources of finance (develop on separate budget format)	
Data analysis method	

Communication approach	

Exercise Nine: SOCIO-ECONOMIC BASELINE ASSESSMENT

A. Exercise Purpose:

This section provides an overview of simple steps for conducting a socioeconomic baseline assessment and indicators to be considered to support coastal resource management and climate adaptation planning. A Socioeconomic assessment generates baseline information on the demographic, socioeconomic conditions of the community and their relationship with the natural resources. The information helps better understand different aspects of the community and identify priorities that should be considered for resource management planning and community development. It can also highlight areas and extent of community vulnerability to climate events and impacts, and their ability and potential to adapt. As socioeconomic assessments are repeated over time, the baseline becomes crucial for monitoring changes in the community as a result of coastal and natural resource management intervention or climate change adaptation activities. Understanding these changes allow for evaluating and improving of existing resource management or climate adaptation strategies and activities. In climate adaptation, socioeconomic monitoring should become a part of an integrated monitoring framework, in which data on climate, physical and biological conditions and impacts, are all taken into consideration.

There are different indicators and variables that can be included in a socioeconomic assessment. To make sure that you select the indicators most useful and relevant to your site, it is important that you first develop a set of assessment objectives. Ask yourself what information do you need to better understand your community when you do your management planning or develop climate adaptation strategies. The assessment objectives help you to stay focused and will serve as your guide for the rest of your assessment.

Examples of assessment objectives and indicators are provided as follows:

Objective 1: To understand the demographic profiles of the community

The basic demographic indicators include number of people and households, permanent and temporary (such as for seasonal employment) migration rate, education levels, age groups, proportion (such as percentages) of people with different types of occupations or means of livelihood (including income sources and subsistence activities), level of income or wealth, language, clan and religious affiliation. These data may be available from existing secondary data sources (such as census, reports and previous studies) or can be collected through household survey or interview with informants who are knowledgeable of the demographic profiles of the community. The information serves as basic baseline that could alert the managers when drastic changes happen with the demographic profiles of a site to further examine their causes.

Objective 2: To understand the infrastructure and community services

These are commonly man made structures and services that are important for the well-being of the community. Indicators for this objective include types and location of community services (such as churches, health services, and schools), types and location of community infrastructure (such as roads, ports, and other kinds of transportation, sewage and waste disposal systems, telecommunications, power and water supplies and distribution), and proportion of people who have access to and use them.

Objective 3: To understand relationship of people with natural resources

This is probably the most important objective as it directly provides information useful for natural resource management planning. Some relevant indicators are:

- Proportion of community members with access to different types of natural resources
- Types of resource use of different community members or groups
- Level of livelihood dependency on natural resources
- Perceived condition of priority natural resources
- Formal, informal and traditional ways of managing resources
- Stakeholder groups and level of community participation in resource management
- Management effectiveness and impacts on the community

Objective 4: To understand the community's vulnerability to climate events and impacts

In the past few years, many coastal and island communities have been increasingly effected by the impacts of climate variability and change, including, sea level rise, coastal erosion, salt water inundation, and mass coral bleaching. To understand the vulnerability of a community and its natural resources, a vulnerability assessment can be carried out. Socio-economic information is critical to complete a vulnerability assessment as it can help clarify how vulnerable a community is to the impacts of climate change and climate variability. In particular, socio-economic information helps to clarify the community's capacity to cope with and recover from, and adapt to these impacts. A socioeconomic assessment and monitoring is hence used to help assess vulnerability and make decision on locally relevant adaptation planning. There are needs specifically for information related to the nature and extent of vulnerability of the community to impacts and conditions of climate change and variability and community's dependence on impacted (or potentially impacted) resources. There are also needs to understand community capacity to cope with, recover from and adapt to these impacts. A socioeconomic assessment and monitoring is hence used to help assess vulnerability and make decision on locally relevant adaptation planning.

The vulnerability assessment approach recommended in this guideline, examines three main factors (exposure, sensitivity, and adaptive capacity) which collectively determine a communities level of vulnerability to climate change impacts. Socio-economic information can be gathered to understand these factors, and therefore the level of vulnerability. This information can then be used to develop successful adaptation strategies, which are designed to decrease the level of vulnerability by decreasing the exposure and sensitivity of the community while also increasing their adaptive capacity.. Below are specific objectives and indicators that can be assessed to help understand these factors (exposure, sensitivity, and adaptive capacity).

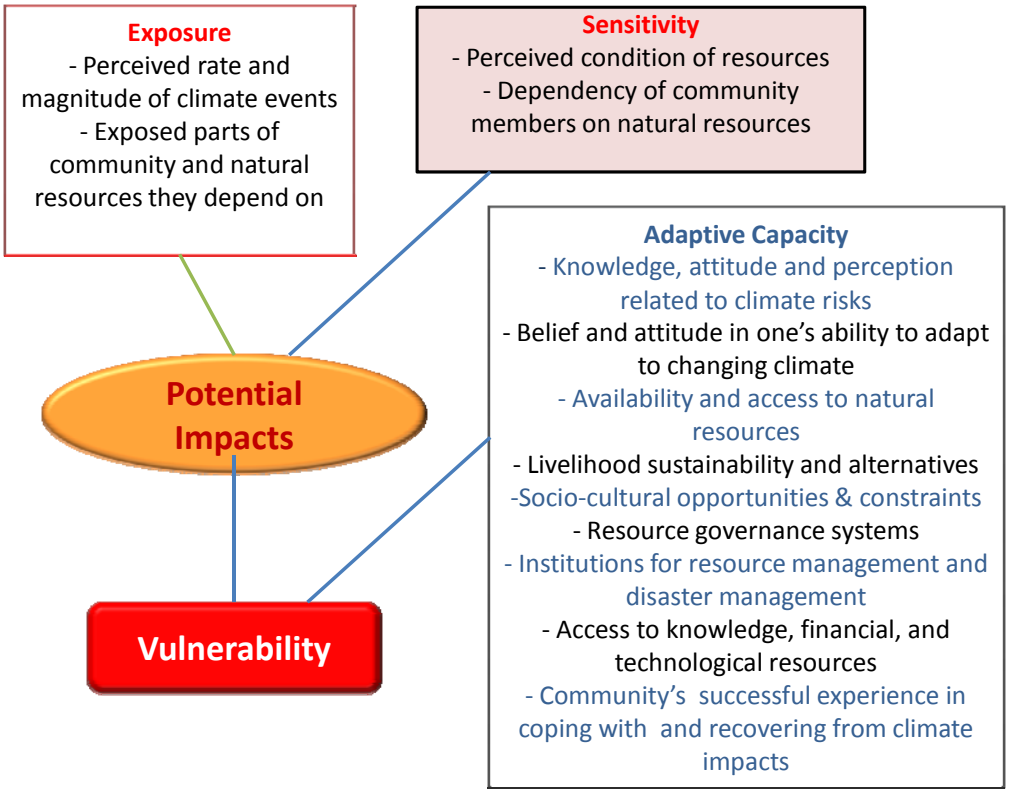


Figure ??: Social factors contributing to vulnerability to changing climate

Within the overall objective of understanding the community's vulnerability to climate events and impacts, there are several potential detailed objectives and indicators including:

Assessment objective 4.1 on exposure: To identify which parts of the community and resources are exposed to climate events. Examples of indicators are**:**

- Perceived frequency and severity of different types of climate events
- Location, size of area, number of households or population exposed to past and possible future climate events
- Types of community services and infrastructure exposed to past and possible future climate events
- Types of resources (e.g. reefs, farmlands, water sources) community depends on and are exposed to climate events, their location and exposed of area.

Assessment objective 4.2 on sensitivity: To examine the degree to which the community is negatively affected by changes in climate conditions. Example of indicators are:

- Perceived condition of resources community's livelihood depend on
- Types and degree of impacts on these resources from non-climate threats
- Level of socio-cultural and economic dependency of the community to the impacted resources
- Types and level of livelihoods that are secured from local climate events

- Community members who are identified as most sensitive to different types of climate events and their number.
- Please note the sensitivity of the natural resources themselves will be assessed in the biological assessment discussed on page XXX.

Assessment objective 4.3 on adaptive capacity: To understand capability, ability and potential of a community to adapt to climate impacts. Social adaptive capacity encompasses many different dimensions. Try to select indicators that are relevant to the local community. Example of indicators are:

- Level of awareness and knowledge related to climate, climate change and impacts
- Attitude and perception toward climate risks
- Belief and attitude towards one's own ability to successfully make changes to cope with impacts of changing climate
- % of households with ownership or user rights of, and access to natural resources (e.g. land, fresh water, reefs, forests), for livelihood and well-being
- % of households with diversified livelihoods
- Opportunities for alternative and supplementary livelihoods and proportion of the community members with such opportunities
- Socio-cultural factors supporting or inhibiting adaptation strategies (e.g. social acceptance of changes in livelihood means; sense of home and willingness to relocate; social structure and organization,; dependency on outside sources)
- Availability of life support infrastructure and services (electricity, potable water, tools to subsist, transportation, telecommunication, shelter, healthcare), and proportion of community members who can access them
- Level of availability of resources and institutional framework to cope with impacts from increased climate events and disasters
- Types and nature of social networks and institutions related to preparing for, responding to, and recovering from disaster events
- Leadership systems
- Level of support on climate adaptation from community leaders
- Types and effectiveness of environmental governance
- % of people with knowledge and skills for disaster management
- % of community members who can access different types of resources needed for climate adaptation (e.g. education and training, funding, and technology)

NOTE: It should be noted that the indicators noted in this section are aimed specifically at climate change adaptation work. While many of these indicators will also provide key information about natural resource management planning, it will be important for the planning team to ensure that natural resource management objectives and indicators are also considered during the planning process.

B. Facilitation Suggestions

To better understand issues which are important to the local communities and to define the objectives assessment and select indicators that are locally relevant, prior to the assessment facilitators should inform themselves of available demographic and socioeconomic condition of the focal community. Information may come from secondary data sources, for example census data and previous studies, people who are

knowledgeable about the communities, or local stakeholders. Consulting with local community members also help provide information on local protocol and logistical arrangements for the field data collection.

Conducting a socioeconomic assessment requires a team of people with different skills such as survey design, field data collection, and data analysis and management. Training, briefing, and contracting outside consultants with relevant expertise may become crucial for the success of the assessment.

Socioeconomic assessment employs different data collecting tools, many of which are mentioned in the other parts of this guideline. In addition to common social research methods (such as survey, focus group discussion, key informant interview, and participant observation), several methods mentioned Section 3 of this guidebook, including community mapping, historical timelines, seasonal calendar, and transect walk, can be used to collect certain types of socioeconomic data mentioned above. During the planning process, the planning team should review which socio-economic information will be collected by which tool.

C. Background Information for Facilitators

An entire plan for conducting the socio-economic assessment should be developed and agreed to with community leaders before the assessment is initiated. Detailed guidance on how to develop and conduct a socio-economic assessment is available through several guides[1]. Facilitators should familiarize themselves with existing socioeconomic monitoring guidelines and seek technical assistance when needed. These guidelines provide larger lists of indicators, details on different data collecting methods, sampling design, examples of survey and interview questions, explanation on how to analyze collected data, worksheets and checklists that facilitate different steps of the assessment. SEM-Pasifika has been developed specifically to focus on resource management programs in the Pacific and therefore is very much in line with the approaches shared in this Management and Adaptation Planning Guide. Steps involved in socioeconomic assessment generally include:

12. Identify target community to be assessed and/or monitored
13. Define assessment objectives. Ensure that the data you collect will turn into information that is useful for your management and adaptation planning
14. Indentify indicators related to the assessment objectives

[1] Related guidelines and frameworks include:
1) SEM-Pasifika (Socioeconomic Monitoring for Coastal Managers in Pacific Island Countries, http://www.socmon.org/download.ashx?docid=A0000003799_1;
2) Socioeconomic Fisheries Surveys in Pacific Islands: a Manual for the Collection of a Minimum Dataset, http://www.spc.int/DigitalLibrary/Doc/FAME/Manuals/Kronen_07_SocioFishSurveys.pdf;
3) Socioeconomic Assessment Guidelines for Pacific Adaptation to Climate Change (SEA-PACC) and 4), under development by SPREP;
4) A Framework for Social Adaptation to Climate Change; Sustaining Tropical Coastal Communities and Industries, http://data.iucn.org/dbtw-wpd/edocs/2010-022.pdf.

15. Prepare for the assessment (form an assessment team, develop work plan, budget allocation, reconnaissance visit, audience analysis for assessment results)
16. Select data collecting methods that are appropriate to collect the data on your indicators and are possible with your team capacity. If you plan to do surveys and need to draw a sample from the population, make sure that you use a proper sampling design to allow for data that will statistically represent your population.
17. Analyze and interpret collected data. If is recommended that you present the data back to the community, from who you collected the data, to inform them of and validate your findings. Make sure that you meet the objectives of your assessment.
18. Communicate your results. Develop a communication plan, specifying your target audience, communications purpose, means to reach and communicate with them, schedule, people in charge, and communication product which may include reports, summary sheets, presentation slides, posters, etc.
19. Use key socioeconomic information to plan or adapt your management. Whenever possible, integrate the socioeconomic information with data from other types of assessment/monitoring, such as biological data, and draw conclusion that integrates learning and lessons from different types of data sets.

Exercise Ten: HISTORICAL AND PROJECTED TIMELINE

A. Exercise Purpose: This exercise provides a way for the community to review past major social and natural events that have happened in the community over a long period of time to understand trends in frequency, impacts, and responses to those impacts. This exercise also can help a community think ahead about the future predictions of climate change in the region to understand the likely climate events that may occur more frequently and which climate change threats may be the most significant to them to develop adaptations strategies around.

B. Facilitation Suggestions

Prior to this exercise with the community, it is good for the planning team to collate information that may be relevant for a historical discussion. This information could be found in historical documents for the community, aerial photos, historical data sets, etc. The planning team should be familiar with the material prior to holding a community meeting and can utilize this information as part of the discussion if appropriate. It is also very good to bring the community map to this project to utilize as a discussion tool.

When carrying out the exercise in the community, a mix of community members including elders, adults and youth should be included. Begin the exercise by explaining the purpose of doing a historical timeline. It is good to emphasize that the community has been dealing with climate events forever (this is not new) and that the aim of this step is to understand the events that occurred in the past and how the community was impacted and dealt with them. This historical knowledge

can inform how to best prepare for future events that are similar and may be more frequent or powerful.

Begin by placing pages of flip chart paper on the wall and drawing a horizontal line across the paper. You can begin the discussion by asking people to identify key events in history (e.g. typhoons, floods, drought, death of an important community member). As each event is identified, record it along the line in the order that each event happened. Add flip chart paper as needed to go back as far as the community can remember. Be sure to write in large letters so that the whole group can see and mark down the year (and month if possible) with each event.

Upon completing the historical time line of events that occurred in the community, it is important to consider how these events impacted the community and if these events are happening more or less frequently over time.

The facilitator should walk through the timeline events and identify all of the natural/environmental events. Then the facilitator should ask members to explain the social and natural impacts from these events, and perceptions on if the events are occurring more frequently or not. Record these answers and discussion points. If appropriate, add information to the community map identifying specific areas prone to certain climate related impacts (e.g. areas that flood, areas that are inundated with salt water, areas of erosion, bleaching corals, etc)

Finally, the facilitator should review climate change predictions for the region and discuss how these events may be influenced by climate change. Make notes of which events and impacts may occur or become more intense based on future predictions. This information will inform the vulnerability assessment.

C. Background Information for Facilitators

It may be necessary to prompt discussion and memory of specific events with a series of questions. Questions to consider are:

1. What climate events (typhoons, flooding, drougt) have occurred in the community and when?
2. What natural resource events have occurred in the community and when? (e.g. mass mortality of fish, failing crops, bleaching events, COTS outbreak etc.)
3. Have any health related epidemics occurred in the community and if so when?
4. When was development of specific infrastructure built? (e.g. schools, power lines, etc.
5. Were there any specific times when natural resources were changed by human activities (e.g. introduction of specific fishing methods, removal of coastal vegetation or upland forest, etc.)

Questions to consider to prompt discussion about socio-economic and biological impacts and changes in natural events over time are:

6. Is the intensity and frequency of climate events increasing, decreasing, or staying the same over time?

7. How and to what degree were social, economic, and ecological RESOURCES affected by past events?
8. Was everyone equally impacted? If not, what were the differences between the individual and various groups?
9. How did those impacted by past events recover from them?

Exercise Eleven: SEASONAL CALENDAR

A. Exercise Purpose: This exercise provides a way for the community to review annual cycles including climate events (e.g. rainy/dry season) and associated natural seasons (e.g. fruiting and spawning periods) and social activities (e.g. harvesting periods). This exercise can be used to understand changes in seasonal events, potential social and natural impacts from those changes, and how to prepare strategies to deal with changes.

B. Facilitation Suggestions

Begin by drawing a large circle on flip chart paper. Divide the circle from top to bottom and then into 12 "pie slices". Explain that the top of the circle is the beginning of the year and the bottom of the circle is half way through the year with the top being the end of the year. Divide the participants into four groups and have each group focus on one quarter of the seasonal calendar. Ask each group to identify the normal weather patterns, natural events (e.g. spawning aggregations, fruiting), and social events (e.g. harvesting, fishing) that occur during that time/ "slice" of the year. Upon each group completing their time of the year, bring the larger group together and review each group's work. Allow other community members to add/revise each section.

At the end of the exercise it is important to discuss any changes in seasonal events that have been noticed (and why these changes are occurring, if known). It is also important to look at how these changes have impacted natural or social systems. Add this information onto the calendar and note how long they've been noticing these changes. Finally, the group should consider how predicted climate change could influence these seasonal events (both natural and social) (e.g. how will sea level rise influence king tides and areas that are impacted by king tide events? How will this impact the community?) Be sure to capture information from this discussion.

C. Background Information for Facilitators

Facilitators may want to prompt discussion of small groups focusing on specific times of the year with questions including:

- What is the weather like during this time of the year?
  - Rainy/Dry
  - Wind direction
  - Air temperature
  - Storm events

- What is happening in the ocean?
    - Spawning
    - Migration
    - Turtle nesting
    - Bleaching
    - Currents
    - Tides
    - Sea surface Temperature
    - Harvesting of specific species

- What is happening on land?
    - Fruiting seasons?
    - Birds/migrations
    - Agriculture (planting, fruiting, harvesting)

- What time of year do things occur that affect our communities health?
- What time of year do various food items harvest or spawn?

Upon completing the small group work and revisions by the larger group, the facilitator may consider discussing changes in seasonal events and activities with the following questions:

- Are we noticing any changes to the seasons or these various events (e.g. longer or shorter dry season/ earlier or later fruiting seasons)?
- How long have these specific changes in seasons been happening?
- How might the projected changes in climate influence these seasons?
- When do climate events occur? Based on the historical timeline, are these events likely to increase or decrease?
- Will these events possibly occur during peak times of harvesting certain resources?
- How will changes in the seasons or seasonal event impact socio-economic factors (e.g. food security, income, health)?

Exercise Twelve: COMMUNITY WALK

A. Exercise Purpose: A transect walk is a simple task of physically walking through the community from the highest point to the lowest point (for high islands) or from lagoon to ocean side (for atolls) to look at the land use zones, key ecological features, and threats in various areas of the community. The primary purpose of this exercise is to ground-truth the community map and ensure

that key features have been noted. This exercise explores spatial differences and land use and how climate change and non-climate threats can impact various parts of the community. Physically walking through the community can help community members visualize important sites including danger zones, evacuation areas, land use zones, resources used during emergencies, areas prone to specific hazards, changes to the environment over time (using historical reference) and land tenure.

B. Facilitation Suggestions: This is typically done with a small group (6-10) of key informants who can provide key information on the various areas of the community. Begin by using a map to identify areas of the community that should be covered. More than one transect walk can be done if there are different areas with different uses/threats that should be included. If this is the case, it is good to divide the community into "zones" that will be explored through different transect walks. It is important to take good notes on each area so that they can be used to modify the existing community map. Take time in each zone of the community to talk about key features including: land use and tenure, threats to the environment, changes over time, and proneness to climate events and impacts.

Through transect walk the community map should be modified based on new information and to be sure that the map is as accurate as possible in terms of locations of various features. If the planning team is using a geo-referenced map, it can be useful to use a GPS for this exercise, however this is not required.

C. Background Information for Facilitators: The group may consider the following questions while doing the transect walk to inform the vulnerability assessment which will be carried out in future steps.

- Where are our primary habitats, resources, and infrastructure? (are they shown correctly on the community map?)
- How have resources changed in specific areas over time?
- How has land use changed over time?
- How have past climate events impacted specific areas?
- Have certain areas been more impacted than others by past climate events?
- Who owns which land areas?
- Where are the emergency evacuation routes?

Exercise Thirteen: IDENTIFYING, PRIORITIZING, AND MAPPING NATURAL RESOURCE TARGETS

A. Exercise Purpose

The purpose of this exercise is to identify the natural and social resources within your area that should be addressed within your management and adaptation plan. Since these natural resources are the main target of our management initiatives, we will call them "natural and social resource targets."

Natural resource targets can include the following:

- A priority ecosystem (a near-shore coral reef ecosystem, an atoll)
- A specific habitat type (seagrass beds, coral reefs, rivers and streams)
- A specific population of a species (migratory birds, grouper, parrot fish, sea cumbers)
- A charismatic and/or endangered species (hawksbill turtle, giant clams)
- A special geological feature (a blue hole)
- A special biological event (grouper spawning aggregation)

Social Resource Targets can include the following:

- Fresh water supply (catchments, aquifers, etc.)
- Agricultural fields or gardens
- Infrastructure (homes, churches, community buildings, roads)
- Emergency facilities (health centers, evacuation areas)

B. Facilitation Suggestions

You may want to facilitate this session by having participants form small groups of three to six and asking them to fill out the worksheet below. After each small group has filled out the worksheet, you can get the group back together and ask them each to present their findings. You can then summarize the findings on a flip chart sheet that is in the same format as the worksheet. Then ask the group to re-prioritize the natural and social resource targets together.

C. Background Information for Facilitators

It's crucial that participants understand the importance of this exercise. The target resources are extremely important because the entire plan will be designed to manage them. All the components of the management and adaptation plan including the objectives, the activities, and the zoning will be designed to increase the effective management of the target resources.

In many cases, natural resource targets that are chosen by communities may have an economic or cultural importance. This is great as the community will be the main practitioners that are working to make sure the locally managed area is a success.

However, for natural resource targets it is very important that individuals with biological training also help the community to understand the biologically important resources and ecosystems that also should be considered. Many of the economically important species will require protection of key habitats to be productive. Likewise, there may be species that are a high priority biologically that are not important economically. An example may be marine turtles or dolphins depending on the site. Likewise, there may also be important indicator species such as butterfly fish that can help us to understand the relative health of an ecosystem. Butterfly fish eat coral and therefore their population level is often a good indication of the health of the reef. In a locally managed area we do not want to overemphasize biological diversity at the expense of community interests; however, its important that an informed biologist help make suggestions that community members can consider in identifying their priority target natural resources.

It is also important to involve the right experts to support community planning around social resource targets. Examples of these experts could be representatives from water management agencies, health organization, or hazard management agencies. Once the resources are prioritized it will be important to revisit the planning team and decide if additional experts should participate in the planning process.

D. Worksheets

(1) In your small group discuss and identify the 10 top natural resource targets that characterize the marine, freshwater, and/or terrestrial components of your site. List these in the table below under the "natural resource target" column. Also identify the top 5 social resource targets. List these in the table below under the "social resource target" column.

(2) Discuss and document why each target is important to the participants in your group

(3) Detail the current status of this target resource as best as you can

(4) Prioritize all of your targets through a simple voting system. Each participant in the group can be given 10 small stick one dots (or they can use ten check marks with a pen if stick on dots are not available). Each participant can put one ore more dots next to target that they feel are most important. The target with the most dots will be the highest priority.

(5) The participants should then discuss and explain why each target has been given the priority level.

(6) The two small groups can get back into plenary and discuss their results. If possible, the facilitator can help to integrate the results from the two groups including a re-prioritization to come up with the final list. If necessary the final priority can be determined through another voting process. The facilitator would first combine the priority targets until each target is only shown on the list once. Then each member of the group would be given the same number of dots or check marks as the number of targets. The voting will be conducted and then the priority of each target discussed and explained.

(7) Once the priority resource targets have been identified, the location where they exist and their relative condition (status) should be identified on the community map. You may find that many of the targets are already on the map, but be sure that all the targets are drawn on the map in the locations where they exist and highlight their condition (poor, fair, good, very good).

Natural Resource Target	Why is it Important	Current Status (poor, fair, good, very good)	Priority	Priority Explanation

Social Resource Target	Why is it Important	Current Status (poor, fair, good, very good)	Priority	Priority Explanation

STEP FOUR: MANAGEMENT AND ADAPTATION PLANNING: WHERE DO WE WANT TO GO?

This step should be carried out through one or more community meetings. The Step will cover:

- Developing Your Community Vision of the Future
- Creating a Threat/Solution Model (Part 1) Covering the following Information:
    a. Identifying the Climate Change and Non-Climate Threats and their Impacts
    b. Mapping the non-climate threats and CC impacts/threats
    c. Analyzing the Impacts and Causes of the CC and non-CC Threats
- Strength, Weakness, Opportunity Threat (SWOT) Analysis
- Vulnerability Assessment, identifying the vulnerability of priority resources to climate change impacts
- Prioritizing the Threats
- Creating a Threat/Solution Model (Part 2) Covering the following Information
    e. Identifying Possible Solutions
    f. Identifying Long-term, Medium-Term, and Short-term Outcomes that you want to achieve

This is the main planning step that will involve the entire community (or as many community members as possible). Through this step you will gather a large body of important information from community members about their vision of what they want for the future, what threats they feel are preventing them from achieving this future, and possible solutions to help them overcome the threats and achieve their designed outcomes. After this step, the work will primarily be carried out by a planning team that will take all the important input from the community and craft it into a series of measurable objectives and activities that are designed to help the community achieve the outcomes they are seeking and ultimately achieve their vision.

Exercise Fourteen: CREATING A COMMUNITY VISION

A. Exercise Purpose:

This exercise will assist community members to develop a shared vision of the future. This is one of the most important steps in developing a management and adaptation plan as it will provide the ultimate goal for the management and adaptation plan. All future elements of the plan should be developed to achieve the vision.

A vision is a statement of the preferred future at the site you are trying to manage. The following questions will help you to determine what the preferred future looks like for your area:

- What does the ideal world look like for you at this site in ten years?
- What is happening biologically at your site in that ideal future?
- What is happening economically at your site in that ideal future?
- What is happening socially and culturally at your site in that ideal future?
- What is being left behind for future generations?

B. Facilitation Suggestions

Be sure to have a list of your target natural and social resources somewhere where the entire group can easily see them. One easy way to do this is to write the target natural and social resources on a flip chart and post it where people can easily see it. Be sure to remind people that their vision of the future should take into consideration the condition that they would like to see for these target resources as well as other aspects of the communities social, economic, and cultural life.

Depending on the number of people present, you may choose to carry out this session in one large group or in small groups. If the total group is small enough (fewer than 20 people), you may simply choose to facilitate this process as one group. If the total group is larger, you may find that small groups work better. The advantage of small groups is that more people get to speak; however after the small group sessions, the results have to be summarized into a master vision.

1. One Large Group

    1. Ask the participants to answer the questions on the worksheet below to help them identify their vision.
    2. Once they have answered the questions, the group can craft the answers into a vision statement. Some planning guides suggest that vision statements should be short phrases or only one sentence in length. We suggest that you don't limit the length of your vision statement. You should feel free to write several sentences if it is necessary to articulate your vision. This will give you an opportunity to provide more detail and help prevent your vision statement from being too general. The vision statement should recorded on a flip chart so all the participants can see it
    3. At this point, we recommend that you don't spend time word smithing your vision statement. A small group can be tasked with crafting a final vision statement to be reviewed by the other participants.

2. Small Groups (Each small group will need a facilitator.)

    1. Have participants form small groups of four to eight.
    2. Ask the participants to answer the questions on the worksheet below to help them identify their vision.
    3. Once they have answered the questions, the small groupfacilitator should help them craft the answers into a draft vision statement. As we mentioned above, don't limit the length of your statement and don't worry about word-smithing it at this point.
    4. Once each group has completed the entire process, bring them back together and lead the entire group through a process to summarize the results. . It is not important to capture every single element in the summary process, but the facilitator should collect all the input and make sure that its all included in the summary.
    5. Ask a small group of approximately three people to take all the information and craft it into a Vision Statement. This group can work on this during a break or after the meeting. The final Vision Statement should be presented and everyone should be provided an opportunity to comment and update the statement.

C. Background Information for Facilitators:

In addition the guiding questions in the worksheet, it may be helpful to share the following information with the participants.

The vision is supposed to be an imagined or envisioned future that meets your dreams for the environment, natural resources, culture, economy, and other social activities, and other aspects of your community.

One of the best ways to develop the vision is to close your eyes and imagine that you have traveled through time to ten years into the future. In your dream for your community, what would you see. What would you physically see in terms of infrastructure and activities that are going on in the community. What would people be doing? What would the natural resources look like? What would people's income and quality of life be like? Don't hesitate to dream big as your vision will guide the objectives and the activities of the management and adaptation plan.

Your vision statement should…

- Describe what you all want to see happening at your site in the future;
- Not assume that the future world will be the same as the world today;
- Be written in the present tense as if you were living in that future right now;
- Be specific to your site and group;
- Be positive and inspiring; and
- Be idealistic — but not so much so that the vision is clearly unrealistic to achieve.
- Be long enough to capture detail about your site and what your community wants for its future. Try to avoid being too general in your vision.

D. Worksheets

(1) To help develop a vision, answer the following questions:

What does the ideal world look like for you at this site in ten years?	
What is happening biologically at your site in that ideal future?	
What is happening socially and culturally at your site in that ideal future?	
What is being left behind for future generations?	

Answer these questions in one large group or in small groups. The facilitator or a member of your group can then summarize these answers into a draft vision statement that helps to cover everything your group wants to see in the future for your site. A small group will then be chosen to develop a more complete Vision Statement and present that back to the entire group for their review and approval.

Exercise Fifteen: CREATING A THREAT/SOLUTION MODEL (PART ONE)

A. Exercise Purpose

The Threat/Solution modeling process provides a great deal of information about your site. This is the main exercise to access critical information about what is going on at your site and about what you can do to better manage the site. In the first part of this process, you will identify the following factors in relation to your site:

1. Threats that are preventing you from achieving your vision
2. The impact of each threat on your target natural and social resources
3. The location where each threat is taking place on your community map
4. The root causes of the threats
5. Understanding the role of climate related threats

This first part of the conceptual model will help the group complete a vulnerability assessment in the next sessions. Specifically, it will help the community vision what they would like their community to look like (both socially and biologically) in the future and what threatens their vision. As such, this information will feed into the vulnerability assessment to help them determine which of their target resources are most "vulnerable" to existing and future threats and which of these threats are most important to address through the planning and adaptation process. Climate change related threats do not need to be analyzed to understand their root cause because the root cause of climate change is a global issue and too large to be addressed by at a community level. However, it is important to understand the root cause of other threats to target resources that could worsen with climate change. These target resources that are threatened by multiple man-made threats as well as climate change threats will be more vulnerable. Additionally, the community through management and adaptation activities can often address these man-made threats