

# Socio-economic Monitoring for Coastal Management in the Caribbean (SocMon)



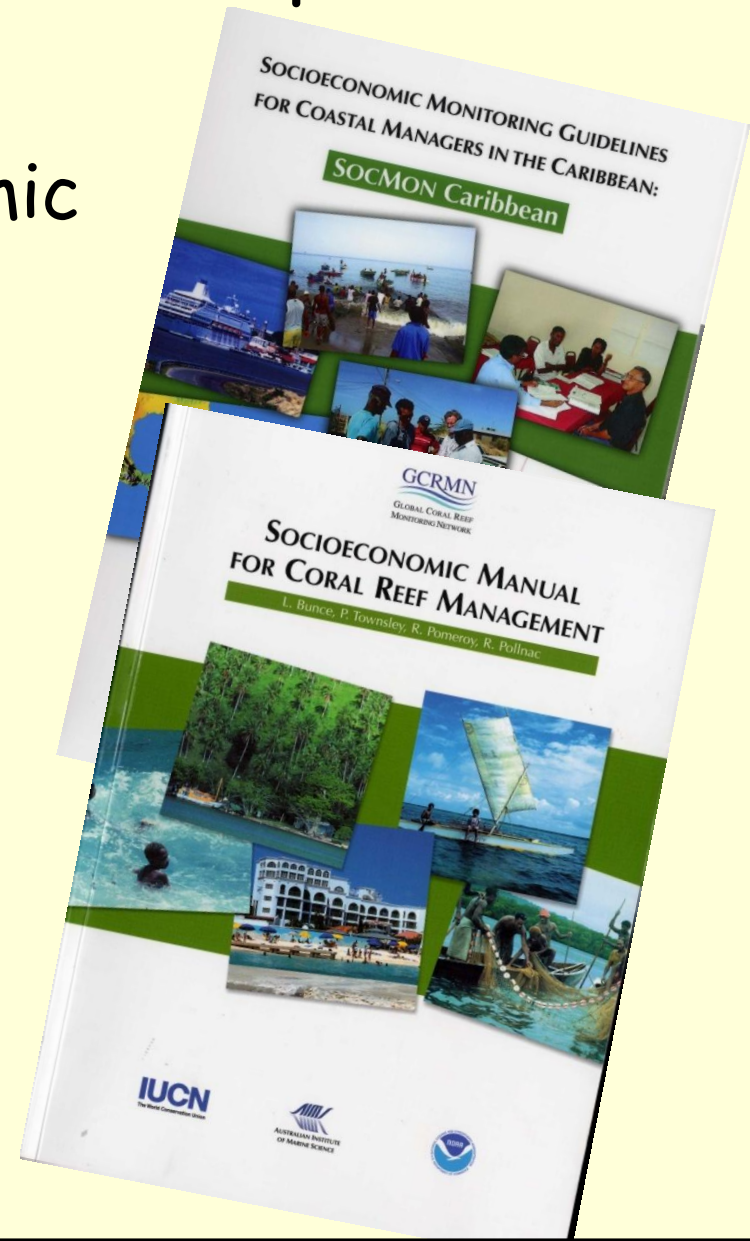
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CERMES, UWI, Cave Hill Campus

Caribbean Challenge SocMon training workshop



# Purpose of this workshop

1. To introduce socio-economic monitoring using SocMon Caribbean methods
2. To develop a feasible SocMon site monitoring plan and timeline for each study site for implementation



# What is SocMon?

- Guidelines on how to do socio-economic monitoring useful for fisheries and coastal management at the site level
- SocMon is used with the "Socio-economic Manual for Coral Reef Management" that contains field methods
- CERMES: Regional SocMon centre for English-speaking C'bbean
- Globally six regions are successfully conducting SocMon:

Caribbean  
Central America  
Pacific Islands  
South Asia  
South East Asia  
Western Indian Ocean

Region-specific,  
standardised guidelines  
for socio-economic  
monitoring



# SocMon Caribbean guidelines: TOC

1. What is this all about?
2. Why should I do this?
3. What's involved?
4. What data do I collect?
5. What do I do with these data?

Appendix A: The variables

Appendix B: Key informant interviews/  
secondary sources guide

Appendix C: Survey guide

Appendix D: Key informant interviews/  
secondary sources analysis sheet

Appendix E: Survey analysis sheet

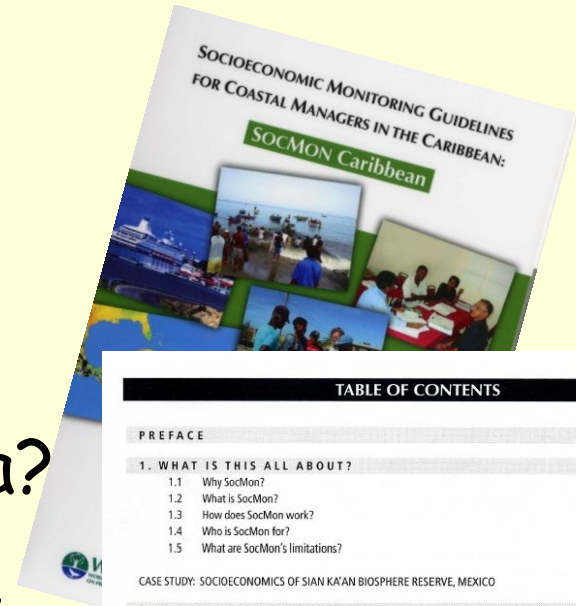


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# SocMon manual: TOC

Introduction

Chapter 1: Preparatory activities

Chapter 2: Reconnaissance and planning

Chapter 3: Field data collection

Chapter 4: Final data analysis

Appendix A: Socio-economic parameters

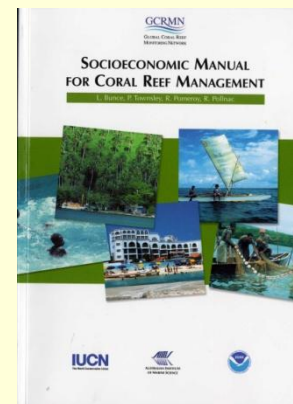
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# SocMon history

- **Nov 2000** *Socio-economic Manual for Coral Reef Management* published: step-by-step guidelines on how to conduct socio-economic assessments
  - **Mar 2003** *SocMon Southeast Asia* published
  - **Oct 2003** *SocMon Caribbean* published
- Region-specific, standardised guidelines for socio-economic monitoring
- Regional and national training workshops:*  
>200 coral reef managers SocMon capacity increased
- 2003-2006** *Regional SocMon centres established*  
CERMES, Barbados: English-speaking C'ibbean (2K3)  
University of Zamorono, Honduras: Spanish-speaking C'ibbean (2K5)
- Global site monitoring underway*

East Africa  
South Asia  
Caribbean  
SE Asia

Belize, Colombia, Nicaragua, Tobago, Guatemala, Indonesia, Philippines, Vietnam, Malaysia, Thailand, Barbados, Jamaica, St. Vincent and the Grenadines, Grenada, St. Kitts and Nevis, Dominica, Mexico

# Why do this? (The Benefits)

- SocMon can help us to understand the socio-economic contexts of coastal resource use by various stakeholders
- This is essential for assessing, predicting and managing coastal resource use over time
- National and regional fisheries, MPA and other management plans call for socio-economic data



# Who is SocMon for?

- Coastal managers (Govt. and NGOs)
- Resource user groups
- Community organisations
- Donors / technical assistance
- Academic and research institutions
- Environmental news media / public





# SocMon in the Caribbean



# Finding SocMon data: www.socmon.org

The screenshot shows a Windows Internet Explorer browser window displaying the SocMon website. The address bar shows the URL <http://www.socmon.org/beta/default.aspx>. The browser's menu bar includes File, Edit, View, Favorites, Tools, and Help. The toolbar contains various icons for navigation and search, including a search box with the text "Search Web" and a "Secure Search" button. The SocMon logo is prominently displayed, featuring a stylized fish and a person silhouette. Below the logo is a navigation menu with buttons for Home, About SocMon, Publications, Database, and Contact Us. The main content area is divided into several sections. On the left, there is a sidebar with the heading "What's New" and a list of regions: Global, Caribbean, Central America, Pacific Islands, South Asia, Southeast Asia, and Western Indian Ocean. The main content area has a heading "Home > Home" and a "Welcome to SocMon" section. Below this is a photograph of two women smiling next to a large blue crate filled with fish. To the right of the photograph is a "What's New" section with a date stamp "2009 16 Dec" and the headline "SEM-Pasifika Training completed in Palau: November 16-25". Below the headline is a photograph of a training session and a paragraph of text describing the training.

http://www.socmon.org/beta/default.aspx - Windows Internet Explorer

http://www.socmon.org/beta/default.aspx

File Edit View Favorites Tools Help

Search Web

Secure Search

McAfee

http://www.socmon.org/beta/default.aspx

Home About SocMon Publications Database Contact Us

What's New

Regions

- Global
- Caribbean
- Central America
- Pacific Islands
- South Asia
- Southeast Asia
- Western Indian Ocean

Home > Home

Welcome to SocMon



2009  
16  
Dec

**SEM-Pasifika Training completed in Palau: November 16-25**



From November 16-25, 2009 a SEM-Pasifika (socioeconomic monitoring for Pacific Island countries) training was carried out by NOAA's Coral Reef Conservation Program in partnership with the Palau International Coral Reef Center and the

Internet 100%

# The SocMon database provides data and information on ~ 80 coastal monitoring sites

http://www.socmon.org/beta/database.aspx - Windows Internet Explorer

http://www.socmon.org/beta/database.aspx

File Edit View Favorites Tools Help

Secure Search McAfee

Home About SocMon Publications Database Contact Us

Home > Database

## Database

Welcome to the SocMon Global Database. Here you can search for monitoring sites and download reports. Use the advanced search if you would like to search by region, country, report language, monitoring purpose, or other search terms.

Keyword  Search

[Keyword Search Tips](#) [Advanced Search](#)

### Monitoring Sites

**Search Result: 80 records**  
First [1](#) [2](#) [3](#) [4](#) [5](#) ... [Last](#)

No	Region	Country	SocMon Site
1.		Kenya, Tanzania	Vanga / Mkinga transboundary
2.		Philippines, Vietnam	Palau Island
3.	Caribbean	Anguilla	Shoal Bay and Island Harbour



# Where are the studies?

- Barbados
  - Graeme Hall Swamp
  - Oistins
- Belize
  - Glovers Reef Marine Reserve
  - Laughing Bird Caye National Park
  - Gladden Spit and Silk Cayes Marine Reserve
- Grenadines Islands
  - Several locations across two countries
- Nicaragua
  - Corn Island lobster fishery
- Trinidad and Tobago
  - Speyside proposed MPA in Tobago
- Nevis
  - The Narrows
- Grenada
  - East coast (La Poterie to La Tante)
- Grenadines Islands
  - Several locations across two countries
- St. Vincent
  - Rose Place
- Dominica
  - West coast fishing villages (Colihaut, Bioche, Dublanc)
- Jamaica
  - Negril Marine Park



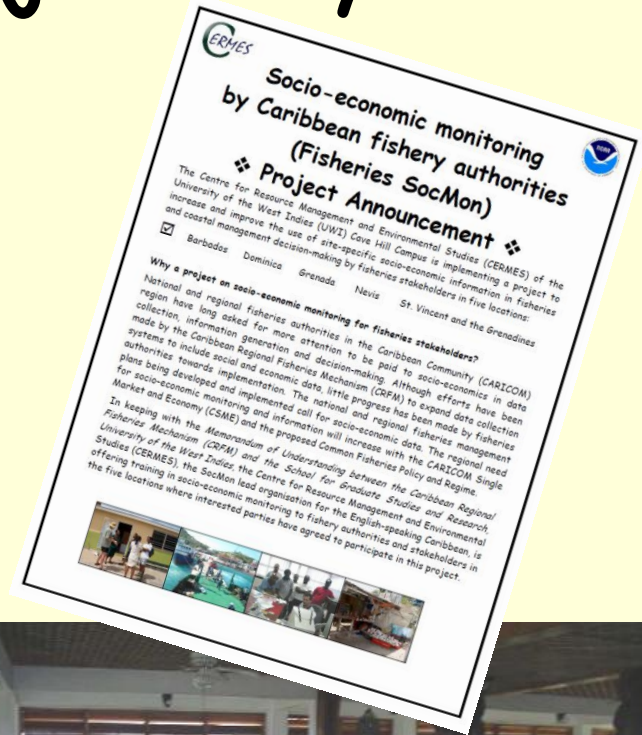
# SocMon project objectives in Caribbean

- Baseline data gathering on coastal communities
- Marine park/protected area management
- Fisheries management planning
- Socio-economic profiles of fisheries
- Enhancing management capacity of stakeholders
- Promoting use of socio-economic data in fisheries management



# Typical SocMon project cycle

- Project announcement
  - project description, purpose, duration, expected outputs
- Site selection
  - via application or prior interest or research need
- Multi-stakeholder inception workshop
  - Informs stakeholders about project, project workplan developed/confirmed, buy-in to project



# Typical SocMon project cycle

- SocMon training\*
- Initiation of site monitoring
  - Data collection
- Validation
  - Provide feedback to stakeholders
- Project reporting
  - Progress reports to funder
  - Site monitoring report
- Data sharing
  - Reef Base





# SocMon training

- 3 to 5-day workshop
- Approx. 20 participants
  - Wide stakeholder participation
- **Introduction to SocMon Caribbean**
  - Guidelines for monitoring
  - Survey and non-survey methods for data collection
  - Field trip to study area/monitoring site (field scoping)
- **Planning for monitoring**
  - Preparatory activities worksheets
- **Monitoring methods**



*\*Longer workshops allow for sample data collection and analysis*



# SocMon process

## Preparatory activities

- Define goals and objectives
- Id and define study area
- Id stakeholders
- Select variables for monitoring
- Create SocMon team

## Planning and reconnaissance

- Compile secondary data: official and unofficial documents, maps, photos etc
- Review and evaluate quality of secondary data
- Brief survey of study area
- Develop work-plan for data collection

## Field data collection (guided by SocMon variables)

- Secondary sources
- Key informant interviews
- Household surveys/interviews
- Observations

## Data analysis and validation

- Involve all team members
- Prioritise quality, not quantity
- Prioritise key learning (issues identified or lessons learned)
- Present key learning in accessible form for interpretation
- Validate key learning with stakeholders and incorporate into useful report and other communications

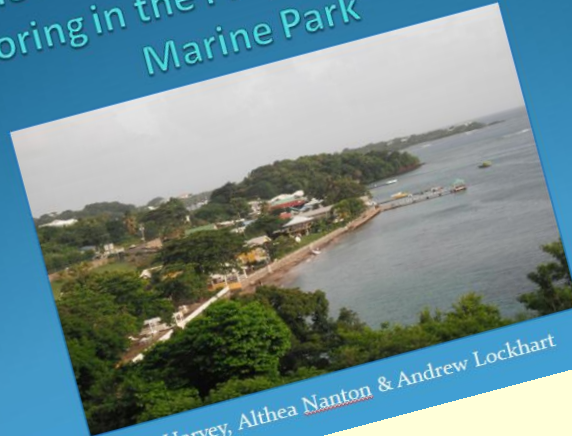
# SocMon case studies

**A quick look at Canaries  
early on Sunday morning**

(With not much on marine resources)

Are first impressions correct?

**Socio Economic & Environmental  
Monitoring in the Proposed South Coast  
Marine Park**



Olando Harvey, Althea Nanton & Andrew Lockhart



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# Preparatory activities

Identify/define the following:

Goals and objectives

Process for conducting monitoring

Stakeholders

Study area and site

Monitoring variables

SocMon team



**GCRMN manual: Chapter one, Pages 19-51**



## **Goal**

### **(Purpose of SocMon)**

To collect socio-economic data to inform marine conservation and development decision-making

## **Objectives**

### **(Issues of interest)**

Determine trends in socio-economic benefits from resource use

Determine how coastal and marine ecosystems provide benefits

Enhance awareness of ecosystem services provided

Involve resource users in monitoring

# Plans with socio-economic aspects provide rationale for using SocMon

- MPA management plans
- Fisheries management plans
- Coastal zone management plans
- Tourism development plans
- Physical development plans
- Poverty alleviation plans

# Identify the study area

## Stakeholders ↔ Study area(s)

- Stakeholder analysis
  - Primary
  - Secondary
  - Interests
  - Organisations
- MPA and watershed management plans
- Core coastal area
- Watershed area
- Satellite study areas



**GCRMN manual: Pages 21-27**

# Consult with stakeholders

- Explain purpose, process and outcomes so that stakeholders can participate if they wish
- Ensure the concerns and priorities of as many stakeholders as is feasible are included in the planning of SocMon
- Ensure the cooperation of stakeholders, and particularly their organizations, in SocMon



**GCRMN manual: Pages 29-36**



# Define objectives

## Management

Design management according to local socio-economic conditions

Establish participatory coastal management

## Research

Establish participatory coastal management

## Development

Collect information to identify ways of limiting socio-economic impacts of development

Establish analysis and planning process to understand socio-economic issues relating to resource use & collect information to guide planning appropriate development activities

## Monitoring

Establish baseline data to monitor impacts of development on local socio-economic conditions

Establish baseline data to monitor impacts of management strategies

## Policy

Collect basic information on resource to guide policy development



# Identify SocMon variables

- 60 socio-economic variables
  - Community-level demographics
  - Coastal and marine activities
  - Governance
  - Attitudes and perceptions
  - Material style of life
- Prioritise SocMon variables
  - Goals of socio-economic assessment/monitoring
  - Importance of data collection
  - Site-specific conditions



SocMon Caribbean guidelines: Pages 17-24

# The SocMon team

- ✓ Coastal manager
- ✓ Social scientist
- ✓ Local advisors
- ✓ Field researchers
  - Interdisciplinary
  - About 5-7 people
  - Meets regularly



# SocMon process

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# Secondary data

- Compile relevant data
  - official and unofficial documents (including newspapers)
  - statistical reports (e.g. census reports)
  - research reports
  - maps
  - aerial photos & satellite images
  - previous/ongoing project reports
  - historical documents and accounts
  - websites
- Review the data
- Evaluate the quality of the data
- \* More in Data Collection



GCRMN manual? Pages 53-57

# Reconnaissance survey

- Brief survey of study area
  - Finalise study site selection for data collection
  - Preliminary information on the # and location of stakeholders
  - ID logistics and arrange field data collection
  - Refine SocMon study objectives & variables (if necessary), study area and sites



**GCRMN manual: Pages 57-61**

# Planning field data collection:

## Work-plan

The work-plan defines the:

- SocMon activities;
- methods & visualisation techniques to be used;
- resources required;
- timing and target dates;
- team responsibilities;
- data processing, reporting



**GCRMN manual; Pages 62-82**

# SocMon process

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# What Data Do I Collect ?



**So many socioeconomic variables to choose from!**

*\*See SocMon Caribbean Guidelines*



# Sources of data

- **Secondary sources**
  - Existing documents, maps, data, etc.
  - Compiling a bibliography, keep it updated
- **Key informants**
  - People knowledgeable on particular topics
  - Use to fill in gaps, profile places, activities
- **Household interviews**
  - Survey questions for specific standard info
  - Interview households in selected settlements
- **Observations**
  - Notes and records, often now done by photos
  - Develop a digital image library, link to GIS

# Secondary data and data from key informants is used to:

- refine the lists of objectives, stakeholder groups, study sites and parameters **[planning]**
- identify gaps in existing knowledge in preparation for field data collection **[questions]**
- ensure the field data collection does not collect information that has already been collected **[efficiency]**
- provide a basis for cross-checking information collected during the field data collection **[validation]**

# Socio-economic variables

\*See Appendix A in  
SocMon Caribbean Guidelines

- Variables set out according to:
- What it is
- How to collect the data
- How to analyse the data
- How the information can be useful to managers



SocMon Caribbean guidelines: Appendix A 45-52

# What Data Do I Collect?

## Community Level Demographics

K1. Study area

K2. Population

K3. Number of households

K4. Migration rate

K5. Age

K6. Gender

K7. Education

K8. Literacy

K9. Ethnicity

K10. Religion

K11. Language

K12. Occupation

K 13. Community infrastructure and business development



**SocMon Caribbean guidelines:  
Pages 18, 20 & Appendix A 29-35**

# What Data Do I Collect?

## Coastal and Marine Activities

K14. Activities

K15. Goods and services

K16. Types of use

K17. Value of goods and services

K18. Goods and services market orientation

K19. Use patterns

K20. Levels and types of impact

K21. Level of use by outsiders

K 22. Household use

K23. Stakeholders

K24. Tourist profile



**SocMon Caribbean guidelines:  
Pages 18, 21 & Appendix A 36-45**



# What Data Do I Collect?

## Governance

K25. Management body

K26. Management plan

K27. Enabling legislation

K28. Management resources

K29. Formal tenure and rules

K30. Informal tenure and rules, customs and traditions

K31. Stakeholder participation

K32. Community and stakeholder groups



SocMon Caribbean guidelines:  
Pages 18, 21 & Appendix A 45-52

# What (Survey) Data Do I Collect ?

## Household demographics

S1. Age

S2. Gender

S3. Ethnicity

S4. Education

S5. Religion

S6. Language

S7. Occupation

S8. Household  
size

S9. Household income

S10. Household activities

S11. Household goods and  
services

S12. Types of household  
uses

S13. Household market  
orientation

S14. Household uses

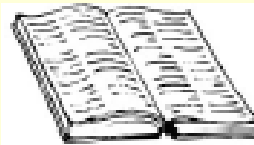


SocMon Caribbean guidelines:  
Pages 19, 22 & Appendix A 53-59

# What (Survey) Data Do I Collect ?

## Attitudes and Perceptions

- S15. Non-market and non-use values
- S16. Perceptions of resource conditions
- S17. Perceived threats
- S18. Awareness of rules and regulations
- S19. Compliance
- S20. Enforcement
- S21. Participation in decision-making
- S22. Membership in stakeholder groups



**SocMon Caribbean guidelines:  
Pages 19, 23 & Appendix A 59-68**

# What (Survey) Data Do I Collect ?

## Attitudes and Perceptions

- S23. Perceived coastal management problems
- S24. Perceived coastal management solutions
- S25. Perceived community problems
- S26. Successes in coastal management
- S27. Challenges in coastal management
- S28. Material style of life



**SocMon Caribbean guidelines:  
Pages 19, 23 & Appendix A 59-68**

# How do I collect the data?

- Observation
- Semi-structured interviews
- Group interviews
- Oral histories
- Surveys
- \*Visualisation techniques
  - maps
  - transects
  - timelines
  - seasonal calendars
  - historical transects
  - decision trees
  - venn diagrams
  - flow charts
  - ranking
  - field analysis





# Mapping, photos, (maybe GIS)

Resource features

Resource uses

Infrastructure

Areas of conflict

Demographics

Reference sites

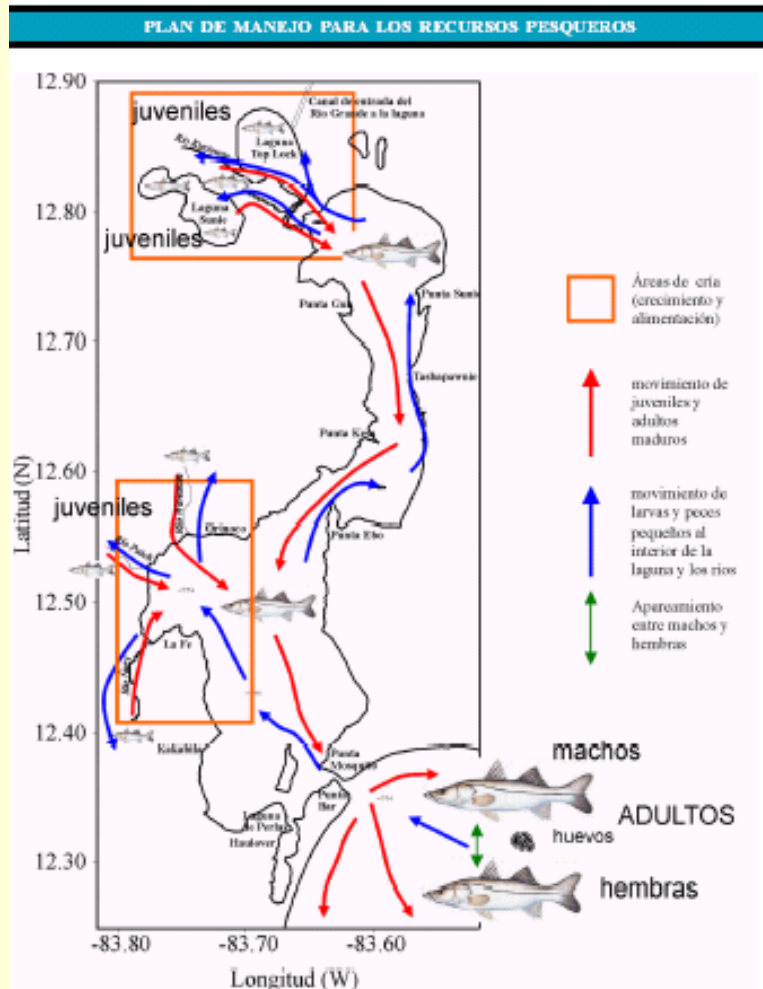
Boundaries, zones

Etc., etc., etc.





# Combine local knowledge with science information



- Climatic conditions
- Life histories, cycles
- Species harvested
- Fishing vessels used
- Fishing methods used
- Processing of catch
- Trade and income
- Fish consumption
- Alternative livelihoods
- Culture and religion

# SocMon process

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- Id and define study area
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# SocMon results /analysis tables

Occupation	PRIMARY		SECONDARY		Total percent of community members dependent on this occupation (primary and secondary)
	Number of household members listed as primary occupation	Percent household members that listed as primary occupation	Number listed as secondary occupation	Percent household members that listed each occupation as secondary	
<i>Fishing</i>	65	32.5%	50	25%	57.5%
<i>Hotel development</i>	50	25%	20	10%	35%
<i>Aquaculture</i>	30	15%	60	30%	45%
<i>Misc.* (coral mining, farming)</i>	5	2.5%	30	15%	17.5%
<i>No occupation**</i>	50	25%	0	0%	25%
<b>TOTAL</b>	200	100%	160	80%	180%
<p>* record together all occupations that were noted for &lt;5% of the household members</p> <p>** for example, unemployed, students, retired</p>					



# SocMon results /analysis tables

Major occupations in community	Percent of working population conducting this occupation as primary occupation	Number of people conducting this occupation as primary occupation	Percent of working population conducting this occupation as secondary occupation	Percent of working population conducting this occupation as tertiary occupation
1. Fishers	60%	600	20%	10%
2. Watersports operators	10%	100	0%	0%
3. Aquaculture workers	20%	200	5%	1%
4. Hotel workers	5%	50	0%	0%
5. Farmers	5%	50	10%	4%





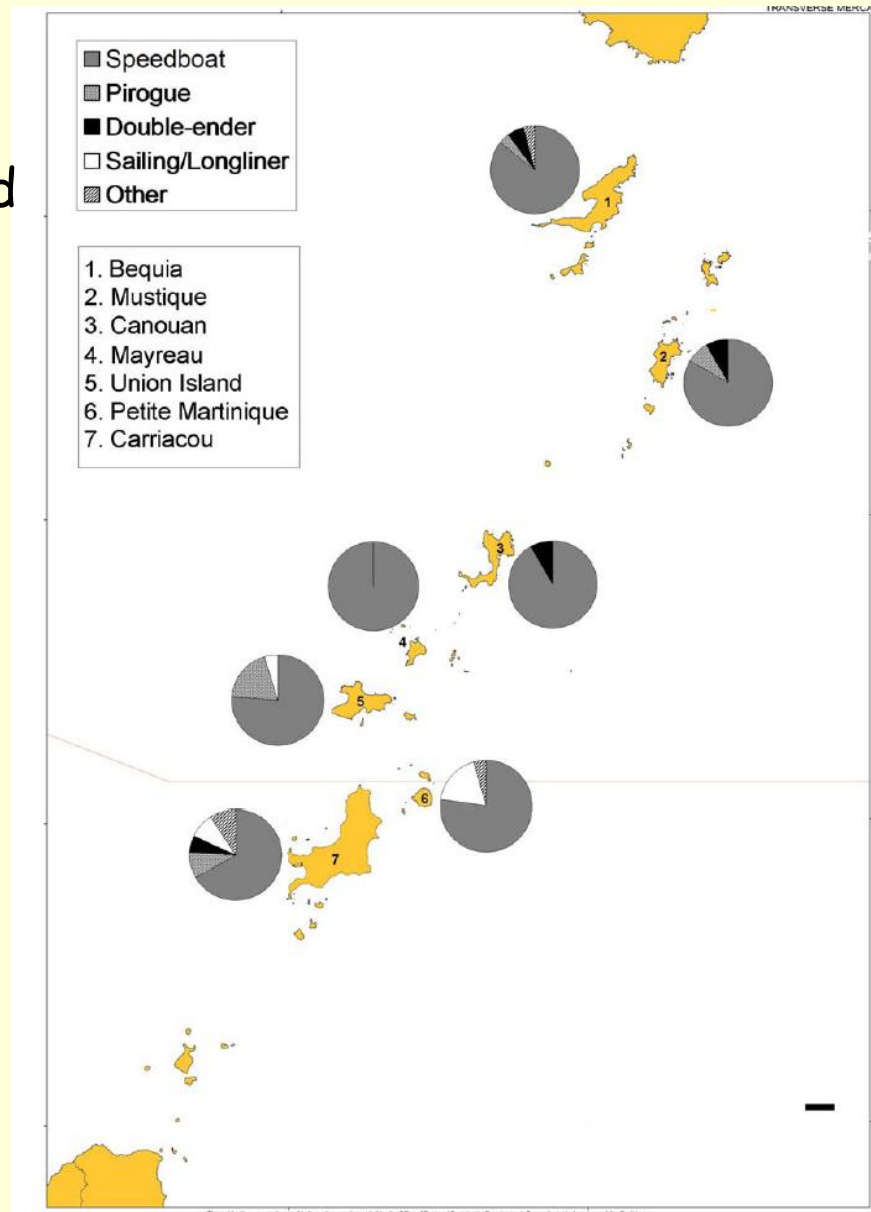
# SocMon results /analysis tables

Coastal and Marine Activities	Coastal and Marine Goods and Services	Types of Use (primary)
<i>Fisheries</i>	<i>Lobster</i>	<i>Trap</i>
	<i>Grouper</i>	<i>Handline</i>
<i>Tourism</i>	<i>Hotel</i>	<i>Guest houses (1-7 rooms)</i>
	<i>Diving</i>	<i>SCUBA</i>
<i>Aqua-culture</i>	<i>Oyster</i>	<i>Line</i>

Coastal and Marine Activities	Coastal and Marine Goods and Services	Value of Goods and Services
<i>Fisheries</i>	<i>Lobster</i>	<i>High</i>
	<i>Grouper</i>	<i>High</i>
<i>Tourism</i>	<i>Hotel</i>	<i>Medium</i>
	<i>Diving</i>	<i>Low</i>
<i>Aqua-culture</i>	<i>Oyster</i>	<i>Medium</i>

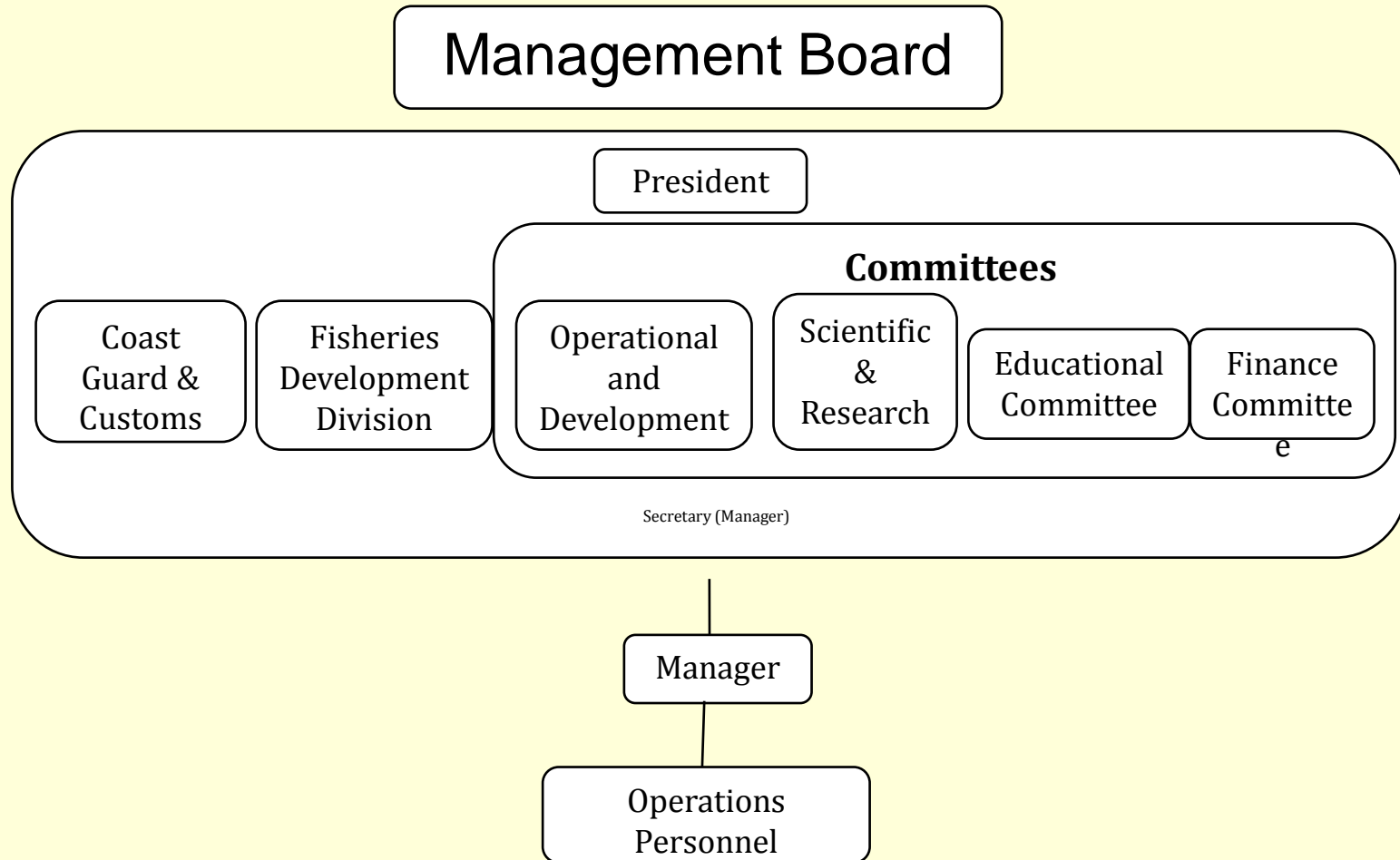


# Distribution of boat type by island



Source: Gill 2007. Socio-economic profile of fisheries in the Grenadines

# Chart organisational and institutional relationships

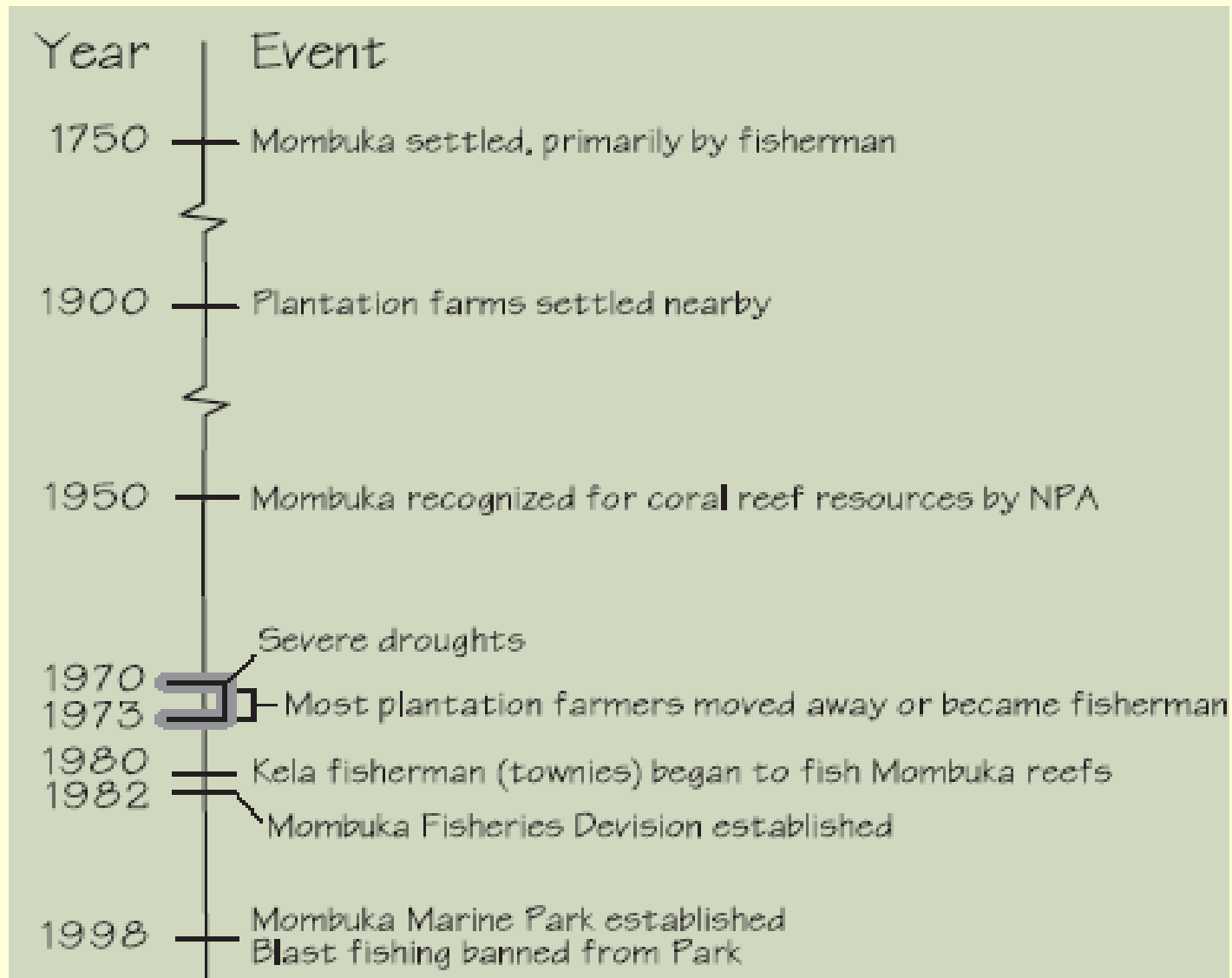


# Local knowledge and classification

Description/ English name	Species	Relative abundance	Changes in conditions	Habitat	Name in local language
Clam (very large, almost smooth)	unknown	•••	+	mud / mangrove	kai
Big spider shell	<i>Lambis lambia</i>	•••	0	reef	spider
Clam (large, white, vertical ridges)	unknown	•••••	0	reef	kai
Clam (large, brown, cross ridges)	<i>Anadara spp</i>	•••••	+	mud	kai nalepa
Pearl oyster	<i>Pinctada margaritifer</i>	•••	0	sand / mud	vilavila kiki
Limpet	<i>Collisella striata</i>	•••	+	coral islands	kai rai
Sunset shell	<i>Asaphis violascens?</i>	•••••	+	beach / mud	kai wi
Small top shell	<i>Trochus maculatus</i>	•••	0	reef edge	pere
Clam (tiny, gray, smooth)	unknown	•••••	0	sand beach, near rocks	sisa
Cone shell	unknown	•••••	0	reef	baukasua
Pen shell	<i>Pinna bicolour</i>	•••••	0	sand / mud	mangali
Clam	unknown	•••••	0	sand	vilavila



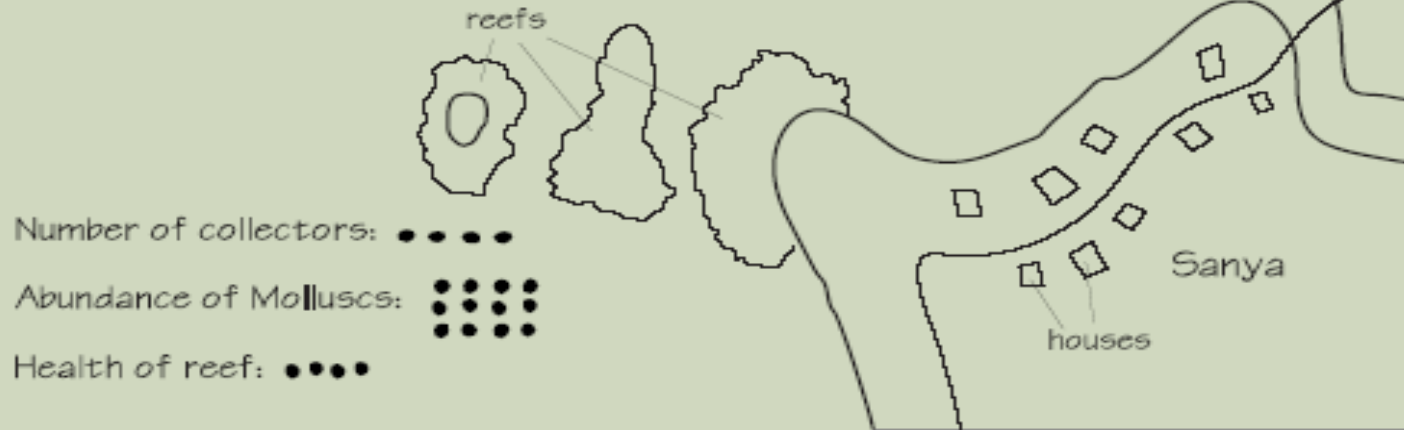
# Timelines of key events



# Historical mapping of changes

## Situation: 20 Years Ago

Frequency of Mollusc consumption: ●●●● (3-4 times/week)



## Situation: Present Day

Frequency of Mollusc consumption: ●● (1-2 times/week)





# Historical transect matrix

Year	Mombuka population	Income from Tourism	Number of fishers	Fish Catch	Coral Reef
1960					
1970					
1980					
1990					
2000					
Trends	+	+	+	-	-
Indicators	<ul style="list-style-type: none"> <li>• More citizens.</li> </ul>	<ul style="list-style-type: none"> <li>• More guest houses</li> <li>• More restaurants</li> </ul>	<ul style="list-style-type: none"> <li>• Crowding conflicts among fishers</li> <li>• More licenses</li> </ul>	<ul style="list-style-type: none"> <li>• Decreasing fisher income</li> <li>• Smaller reported catch</li> </ul>	<ul style="list-style-type: none"> <li>• Coral reef disease</li> <li>• Damaged reef structure</li> </ul>
Reasons	<ul style="list-style-type: none"> <li>• Fishery reputation</li> <li>• National growth</li> </ul>	<ul style="list-style-type: none"> <li>• National reputation for pristine coral reefs, fisheries</li> </ul>	<ul style="list-style-type: none"> <li>• Drought</li> <li>• Diverse fishery supported by reefs</li> </ul>	<ul style="list-style-type: none"> <li>• Over fishing</li> <li>• Coral reef habitat degradation</li> </ul>	<ul style="list-style-type: none"> <li>• Sedimentation</li> <li>• Blast fishing</li> <li>• Increased watersports</li> </ul>



# Ranking e.g. of impact factors

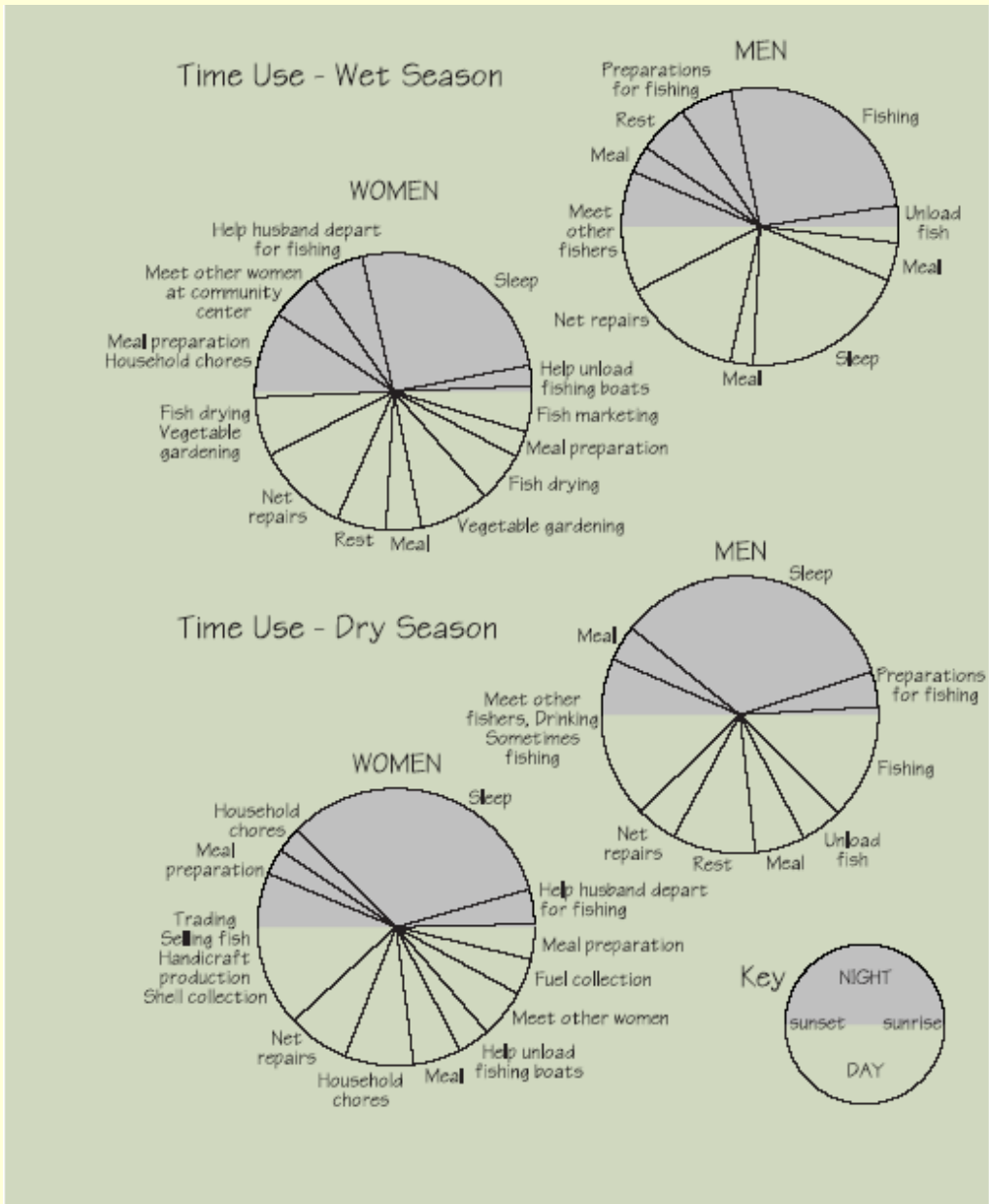
Reef Stakeholders	Number of people	% Men	% Women	% Children	Damage caused to reef
Traditional Fishers	75	95 %	0 %	5 %	Least
Ex-Plantation Fishers	40	80 %	0 %	10 %	Medium
Townie Fishers	65	75 %	0 %	25 %	Highest
Women Gleaners	30	0 %	60 %	40 %	Medium highest



# Seasonal calendar

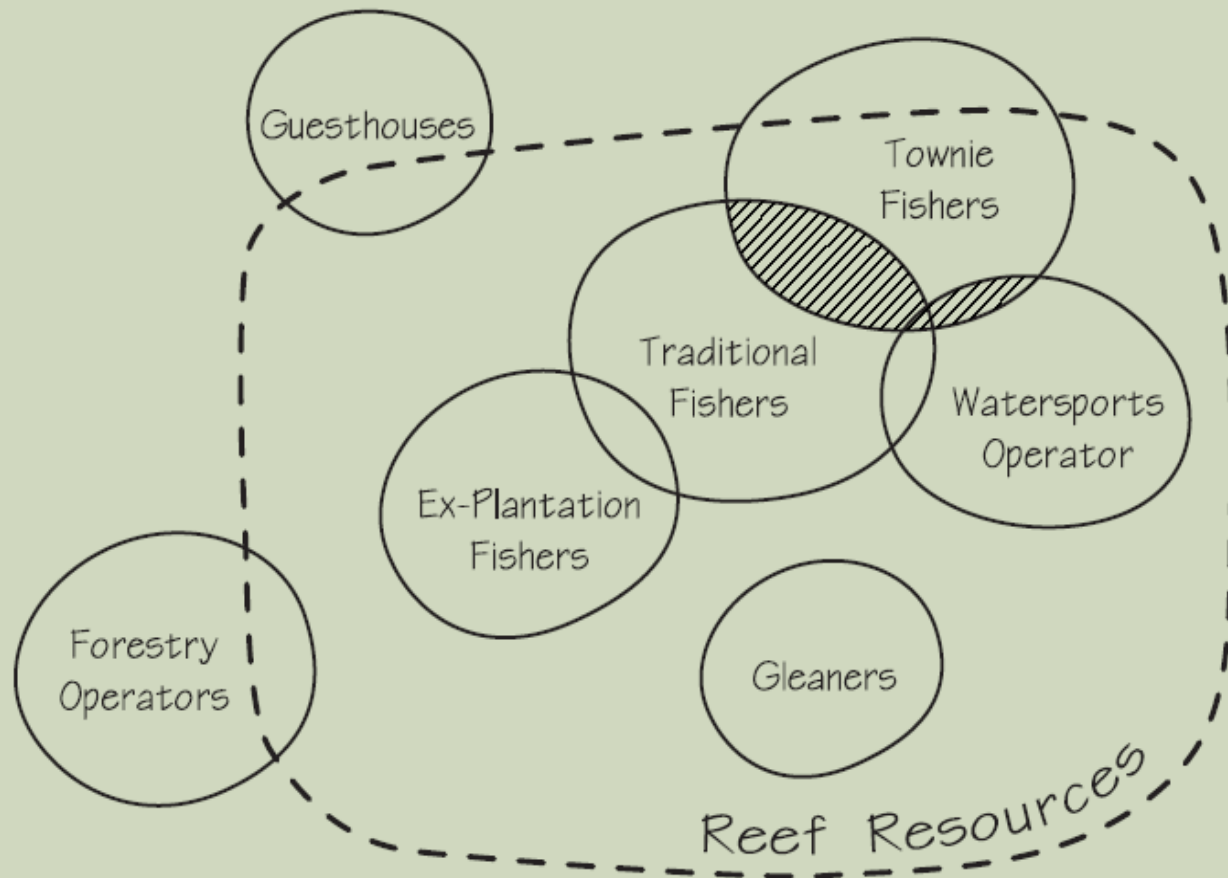
	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec
<i>Weather</i>	calm season		stormy season		hot season		wet season			calm season		
	dry		some rain		rains						dry	
<i>Snapper</i>												
catches	••	•	••	••	••	••••	••	••	••••	••	••	••
prices	••	••	••	••	••	•	••	••	•	•	••	••
<i>Grouper</i>												
catches	••	••	•	•	••	••	••	•	•	••	••	••
prices	••	••	••	••	••	••	••	••	••	••	••	••
<i>Spiny lobster</i>												
catches	••	•			•	•	•	•	••	••	•	•
prices	••	••	••	••	••	••	••	••	••	••	••	••
<i>Income from fishing</i>												
	••	••	•	•	••	••	••	••	••	••	••	•





Daily and seasonal time use patterns



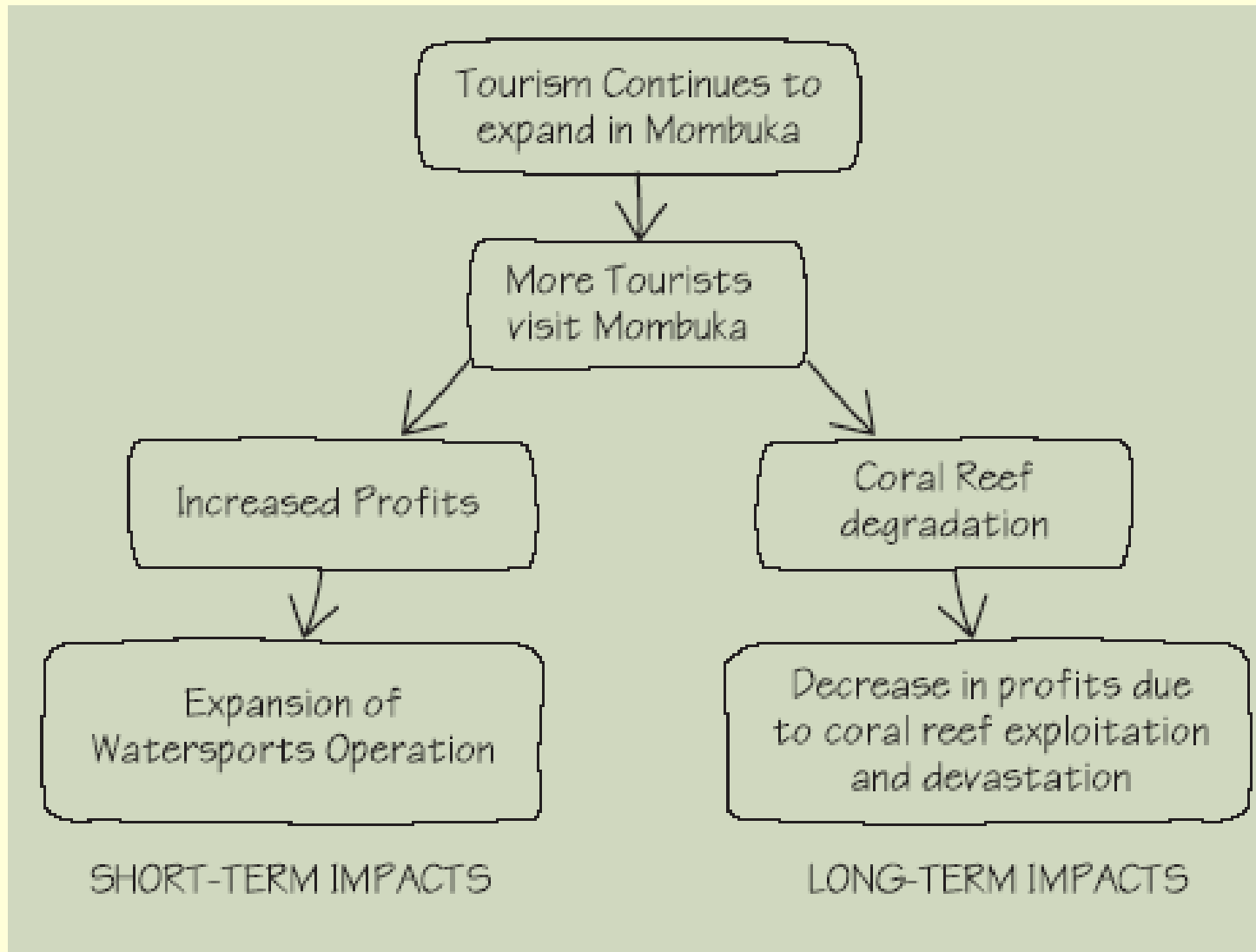


**Venn diagram of resource uses and resource users**

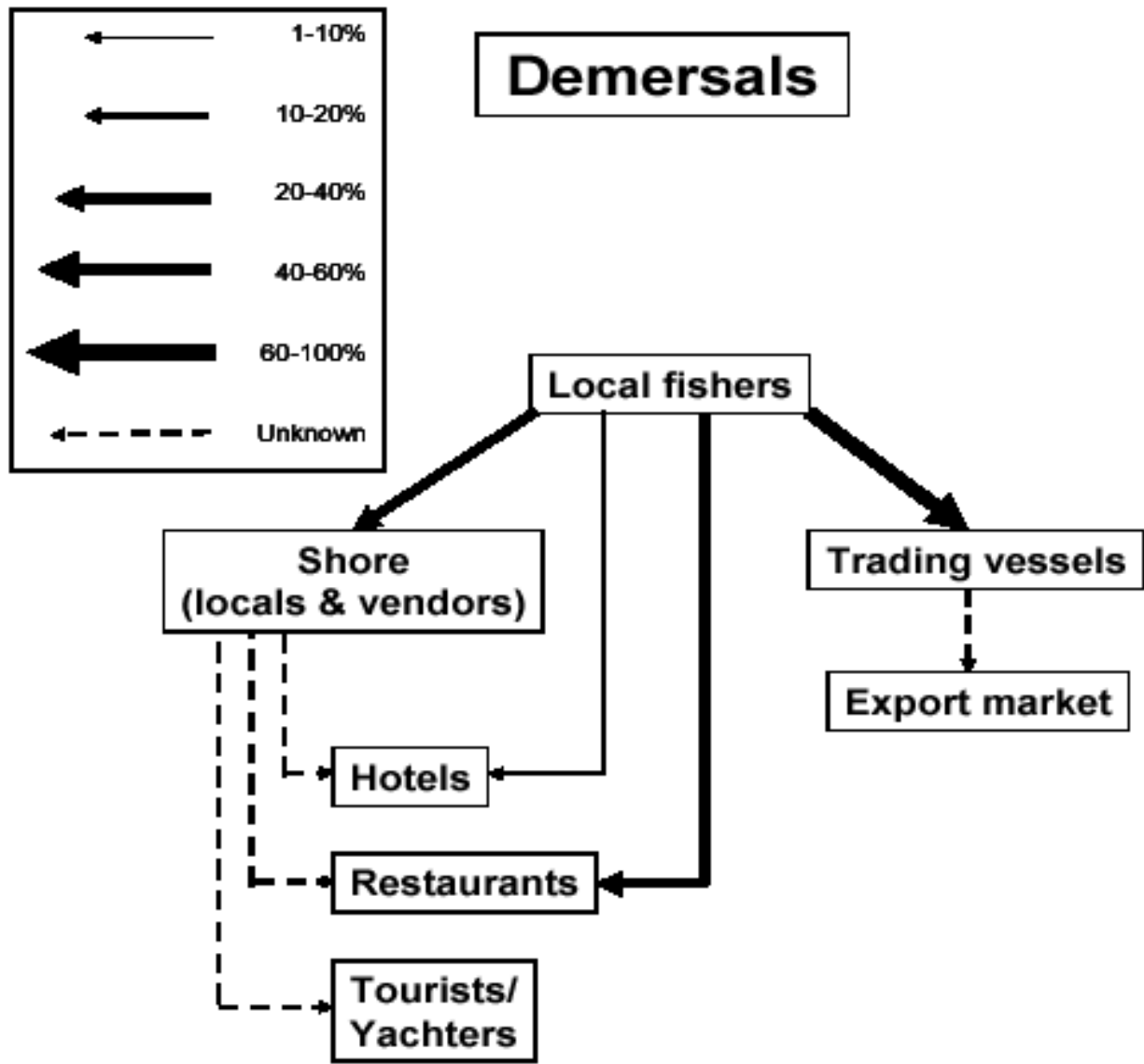
- Sphere of influence
- ▨ Conflict
- ◊ No conflict (work together)
- ⊖ Partial use of reef resources
- ⊕ Dependent on reef resources
- □ No use of reef resources



# Flow charts of various types

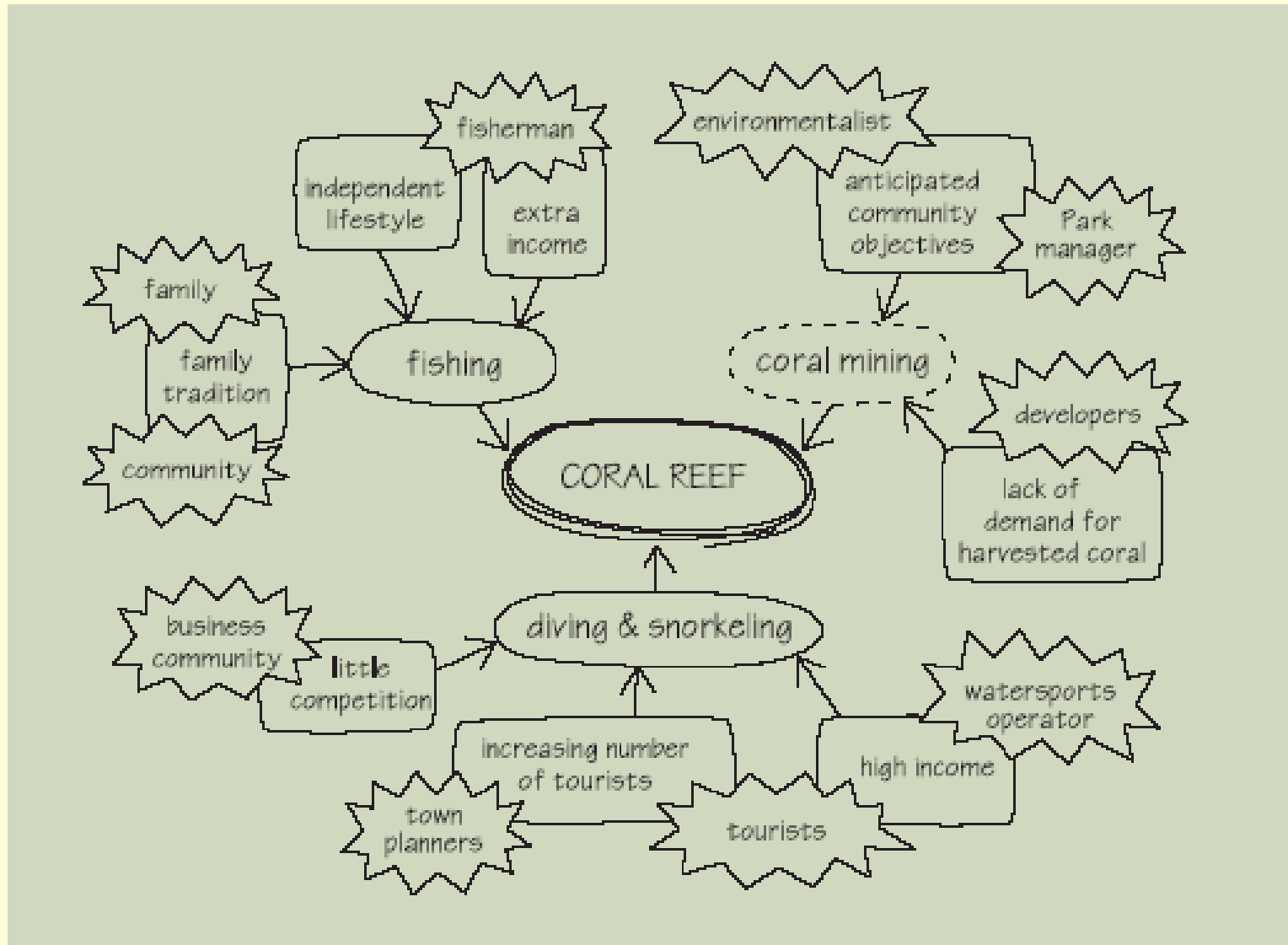






Source: Gill 2005. Soio-economic profile of fisheries in the Grenadines

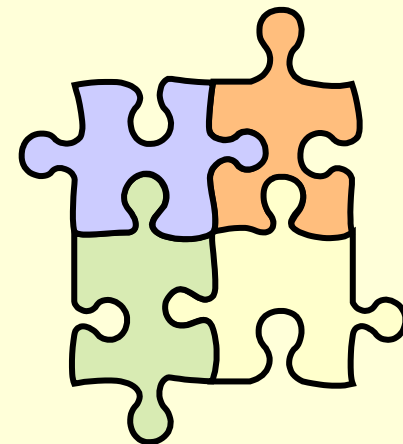
# Decision diagramming



# How to Analyze: Secondary Data, Key Informant info, Household Interviews, Observations

Basic principles for analysis:

- involve all team members
- prioritize quality, not quantity
- prioritize key learning, rather than just getting information
- **Key learning** refers to issues identified or lessons learned that are essential to the objectives of the monitoring, or are needed to understand the socioeconomic context of the stakeholders



# How to Analyze: Secondary Data, Key Informant info, Household Interviews, Observations

Final data analysis involves:

- 1) refining the key learning
- 2) using data to illustrate key learning
- 3) presenting the key learning in an accessible form for interpretation
- 4) validating the key learning with stakeholders
- 5) incorporating the key learning into a useful report and other communications



# Validation workshop

- Verification of data analysis
- Feedback to participants
- Encourage decision-making
- Foster trust and respect
- Accountability, transparency
- Pave way for follow-up
- Community empowerment



# Communication choices

- written material (*report, GCFI paper*)
- visual material (*posters, pictures*)
- oral presentations (*area meetings*)
- one-on-one discussion (*animators*)
- mass media (*newspaper, radio, TV*)
- internet group discussion (*CAMPAM*)
- electronic bulletin boards (*NCRPS?*)

# Using SocMon outputs

- MPA management decision-making
- Stakeholder strategies (fishers, hotels)
- Designing sustainable monitoring
- Prioritising future research
- Preparing project proposals
- Area development planning
- Social improvement plans
- External agency guidance





# Thank You



Centre for Resource Management  
and Environmental Studies  
The University of the West Indies  
Cave Hill Campus  
Barbados