SOCIOECONOMIC MONITORING GUIDELINES FOR COASTAL MANAGERS IN South Asia

SOCMON South Asia

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Copies of SocMon South Asia as well as the GCRMN Manual (2000) can be downloaded from www.iucn.org/marine and www.reefbase.org/socmon

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Comments on SocMon South Asia and feedback on how it was used would be most appreciated. Please send your feedback to Vineeta Hoon or Gaya Sriskanthan

Front cover photos clockwise from top:

Woman curing tuna, Lakshadweep, Vineeta Hoon
Sting ray drying, Bangaram, Lakshadweep, Vineeta Hoon
Fish Sales, North Andaman, Manish Chandi
Resource map from Tamil Nadu, Rajendra Prasad
Male’ skyline, Vineeta Hoon
Mangrove in the Andaman Islands, Gaya Sriskanthan

Back cover photos clockwise from top:

Coconut harvester, Lakshadwep, O.G Moosa
Monitoring Fishers, Lakshadweep, Vineeta Hoon
Reef Gleaning, Lakshadweep, Vineeta Hoon
CORALI workshop, Sri Lanka
Octopus fisher, Lakshadwep, O.G Moosa
Women packing tuna pickles, Minicoy, Vineeta Hoon

Recurrent box drawing - Representation of a fishing boat used in South Asia – Manish Chandi

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PREFACE

During the period of 1998-2002, the Global Coral Reef Monitoring Network (GCRMN) South Asia, sponsored socioeconomic assessments and monitoring training for sites with significant coral reef habitats in the region and followed this up with community based socioeconomic monitoring demonstration projects at five sites where some biophysical surveys had been carried out: three in India (Andaman Islands, Lakshadweep Islands and the Gulf of Mannar) and one each in Sri Lanka and Maldives. Each team received practical training in using the GCRMN Socioeconomic Manual for Coral Reef Management (GCRMN Manual) and to establish a monitoring programme at their field sites. A drawback of the manual was that while it dealt with methods for socioeconomic assessments, it did not touch upon the issue of monitoring. Hence the South Asia field teams were not clear on how to conduct monitoring. They requested a simplified set of guidelines outlining a practical monitoring protocol that could be applied specifically at the site level.

During the Coral Reef and Livelihoods Initiative (CORALI) workshops held in 2007-2008 (an Asia regional initiative with a focus on South Asia, as supported with EU and Finnish Foreign Ministry funding), the CORALI teams from South Asia debated the concept and relevance of SocMon to their work, which often dealt with extremely poor resource users and hence required to pay special attention to the relative levels of poverty among resource users. They were also concerned that socioeconomic monitoring was equivalent to policing communities through monitoring people's activities, and therefore constituted an intrusion into people's privacy. They suggested that monitoring should be community driven and owned. All this has implications on how data should be collected, and from this evolved an approach that focused on monitoring change from the people's perspective. The rationale behind this approach was that changes in the community's perspective are of key importance to management and this is one of the most important contexts in which monitoring needs to be carried out.

The *SocMon South Asia* monitoring guidelines have been developed, keeping in mind that managers of coastal and marine habitats, environment wardens and volunteer teams from the local community, require a clear direction in carrying out socioeconomic monitoring. *SocMon South Asia* compliments the GCRMN Manual by providing a simpler, more structured set of guidelines, which can then be tailored to site needs. The two documents are meant to be used together – *SocMon* provides the guidelines for the priority indicators to assess, and the GCRMN Manual for details of how to do it.

SocMon South Asia highlights experiences from South Asia and draws upon the rich experiences of organisations, projects and programmes that have been actively working with communities in the region for over 10 years: The Coastal Resource Management Project (CRMP) in Sri Lanka; a local community based organisation (CBO), Foundation of Eydhafushi Youth Linkage (FEYLI) and the Atoll Ecosystem Conservation Project in Baa Atoll, Maldives; Indian organisations the People's Action for Development (PAD) based in the Gulf of Mannar, the Andaman and Nicobar Environment Team (ANET) working in the Andaman and Nicobar Islands, and the Centre for Action Research on Environment Science and Society (CARESS) working in the Lakshadweep Islands, have been working on coral reef issues involving local communities for the past decade. In the process, they have developed relevant participatory tools which they feel will be useful for managers. *SocMon South Asia* is the product of substantial collaboration among social scientists, local communities, and coastal managers in the region. The *SocMon South Asia* goals of socioeconomic information, variables and overall structure were developed by building on *SocMon South East Asia, SocMon Caribbean, SocMon Western Indian Ocean* and our experiences with local communities.

SocMon South Asia is a part of a continuing global effort to bring biophysical and socioeconomic monitoring to complement each other and thereby enhance understanding of communities and their relationship to coastal and marine resources. This manual is to be treated as a work in progress and will be updated as and when we receive the feedback from the coastal managers, institutions and community based organisations that use the manual.

Vineeta Hoon & Gaya Sriskanthan
August 2008

SECTION 1: WHAT IS THIS ALL ABOUT?

1.1 WHY SOCMON?

Coastal resource managers realise that coastal resources can no longer be managed from a biophysical focus alone. Community attitudes towards, and uses of, coastal resources have serious implications on the biophysical health of coastal marine systems. The management of coastal resources has equally serious implications for the socioeconomic health of the community. Socioeconomic information is critical for effective coastal management. For example:

SocMon South Asia is a set of guidelines for establishing a socioeconomic monitoring programme at a coastal management site in South Asia.

- A Marine Protected Area or no-take fishing zone is being suggested to protect target species and threatened habitat. The fishing community is worried about losing access and income. Monitoring local perspectives and the livelihood dependence of a coastal community helps build understanding of their resilience and response to changes. This can help managers determine who will be affected and identify acceptable alternative livelihood options. Involving the community in making decisions will help build trust and compliance with rules and regulations.

- Policy-makers and the public want to know if a Marine Protected Area has been effective. Information on changes in people's perceptions of compliance and enforcement of rules and regulations can indicate success or failure of management activities as well as the acceptability of the marine protected area.

- Post-disaster (e.g. post-tsunami) developmental projects are proposed with a focus on livelihoods. Using *SocMon* they can ensure that the project takes into consideration environmental and resource management issues, and understand the inherent resilience of communities and the reef. Monitoring the changes that come along with development and livelihood enhancement can ensure better understanding of the local reef dynamics and people's livelihoods for sustainable development.

It is important to emphasise that *SocMon* is not a rigid set of guidelines. The user of *SocMon*, the socioeconomic monitoring team, is expected to select variables and methods appropriate to its site's needs as discussed in *Section 4.2* (see the case study at the end of this section)

- A major new education programme is proposed for a coastal community. By understanding the means of communication in the community (e.g. meetings, television, newspapers), literacy and education levels of the various user groups and their perceptions of threats, the managers can tailor the programme to use the most appropriate means of communication and ensure the messages are audience-appropriate.

Clearly, to successfully manage coastal resources, managers must balance sustainable use, resource protection and conservation with their community's need for food security, livelihood and the fair use of resources. Understanding this context is essential for assessing, predicting and managing coastal resource use. Socioeconomic information provides an understanding of the social, cultural, economic and political characteristics and conditions of individuals, households, groups, organisations and communities. It can help coastal managers identify potential problems and focus management priorities accordingly.

1.2 WHAT IS SOCMON?

SocMon is a set of guidelines for establishing a socioeconomic monitoring programme at a coastal management site in South Asia. *SocMon* is most appropriate at the study site level. The guidelines provide a prioritised list of socioeconomic variables useful to coastal managers as well as the questions for data collection and the tables for data analysis. It is expected that the guidelines will be tailored to each site's needs. *SocMon* is a companion to the *GCRMN Socioeconomic Manual for Coral Reef Management (GCRMN Manual).*

***SocMon* is intended to:**

- Provide a methodology for regularly collecting basic socioeconomic data useful for coastal management at the site level; and
- Provide a basis for a regional system by which site-level data can feed into national, regional and international databases for comparison.
- Provide a platform for improving regional collaboration on managing coastal and marine resources through the network of experts it involves.

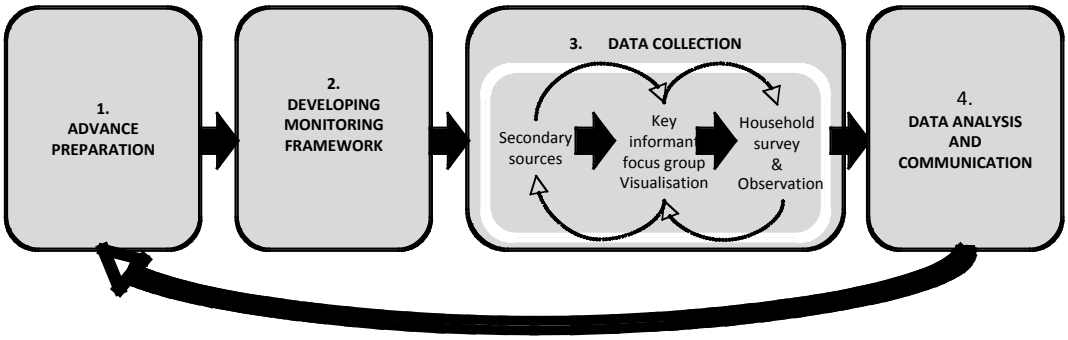
In South Asia, besides the usual gamut of stakeholders, one often has to deal with different levels of poverty amongst resource users, from poor to extremely poor resource users. *SocMon* is intended to provide insight for managers, many of who have science or resource management backgrounds, into what "socioeconomics" means and what socioeconomic data might be useful for management at their site.

Socioeconomic monitoring is about understanding and detecting changes in peoples perceptions vis a vis marine resources over time in order to make timely and informed management decisions. It involves the long-term collection of social, cultural, economic and governance information of people, groups, communities and organisations at regular intervals, which is analysed and fed back into the planning and decision making process. **Monitoring is not an end** in itself **but a means** to improve or evaluate management.

Social scientists have been conducting socioeconomic research throughout South Asia for decades. The user of *SocMon South Asia* may have a socioeconomic monitoring programme currently in use. *SocMon* is intended to complement these programmes by providing a simple, standardised set of guidelines for the region.

1.3 HOW DOES SOCMON WORK?

A socioeconomic monitoring programme includes four key phases as illustrated below:



1) advance preparation, includes site selection, identifying goals of the socioeconomic monitoring, and identifying the monitoring team;
2) building the monitoring framework, which includes understanding: the community context; management objectives; and community perceptions, selecting the key variables and defining the process to conduct the socioeconomic monitoring, identifying and consulting with stakeholders (*GCRMN Manual Chapter 1*),
3) Data collection through secondary sources (see *GCRMN Manual Chapter 2*); key informants and focus groups using visualisation techniques, surveys and observation (see *GCRMN Manual Chapter 3*); and
4) Data entry, data analysis, communication and adaptive management (see *GCRMN Manual Chapter 4*). This is an iterative process, so the results of the phases will likely affect earlier decisions and may require repeating previous steps. This will require flexibility and adaptability.

The *SocMon* variables (see *Section 4* and *Appendix A)* are presented based on the categories of variables as well as on the means of data collection: secondary sources, key informants, observation, visualisation techniques and/or focus groups and surveys. They were divided this way to correlate with the two types of interview guides: one for secondary sources, key informants and focus groups, the other for surveys. The variables are also categorised according to their general importance to collect (see *Section 4.2.2*).

It is important to emphasise again that *SocMon* is not a rigid set of guidelines. The user of *SocMon*, the socioeconomic monitoring team, is expected to select variables (add to, and delete from, the variables prioritised in *SocMon*) and methods appropriate to their site's needs as discussed in *Section 4*.

1.4 WHO IS SOCMON FOR?

Socioeconomic monitoring activities in South Asia will often be dealing with extremely poor resource users and this will require special attention to be paid to the relative levels of poverty in communities and amongst resource users. It will also have implications on the way data is collected. The poor will often be difficult to find and will not easily present themselves as key informants. Whoever carries out *SocMon* will need to make special efforts to identify who the poor are in resource user communities and to understand how they can be included in the process.

Poverty is widespread and persistent in many coastal communities throughout South Asia. While it can be measured in part by assessing income levels, food security, nutritional levels, asset ownership, and health conditions, poverty is often related to structural features – gender and caste and levels of social exclusion are often at the root of people's material poverty. Because of this, the poor in South Asia communities are often particularly difficult to identify and difficult to include in "participatory assessments" – They include women in female headed households, the old, the sick, the disabled, low caste and tribal groups who may be excluded from mainstream life in the community and are reluctant to interact with outsiders. They often feel that they have little to say or that whatever they say is unimportant. This is why researchers need to make particular efforts and require much patience in order to identify them, make contact and make sure that their social conditions are incorporated into monitoring efforts.

The target audience for *SocMon* is coastal managers, including the staff managing coastal areas, local government authorities, non-governmental organisations and local people (e.g. community organisations, fisheries associations, local resource users). Secondary audiences include academics and international and regional organisations.

1.5 WHAT ARE SOCMON'S LIMITATIONS?

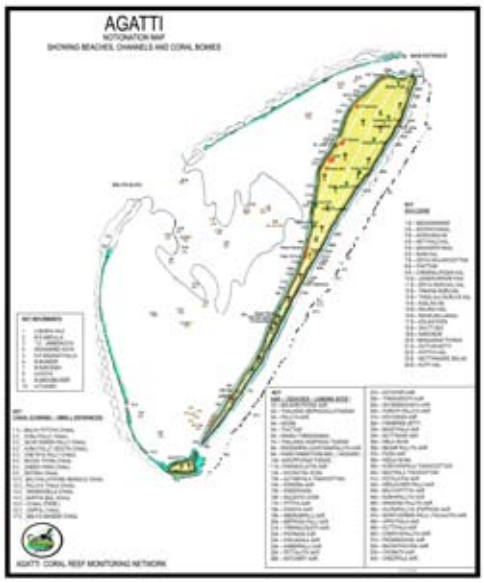
SocMon is a basic set of guidelines. It does not cover all the possible variables for socioeconomic monitoring (e.g. it does not specifically discuss gender as a separate variable). It is designed to be a minimum set of prioritised and relatively simple variables from which to work and was designed as a companion to the *GCRMN Manual*, which does provide detail on the full range of variables possible for a socioeconomic assessment. It is therefore expected that the team will consult the *GCRMN Manual* (particularly *Appendix A: Socioeconomic Parameters*) if it decides to go beyond the variables prioritised for *SocMon*.

SocMon also does not provide detail on how to collect data (e.g. how to conduct an interview). This information is provided in the *GCRMN Manual*, which includes comprehensive explanations of how to conduct socioeconomic data collection, including interviews, focus group interviews, observations and secondary data collection (see *GCRMN Manual Chapter 3: Field Data Collection*). It is therefore suggested that the reader use both documents – *SocMon* for the priority variables to assess, the questions to ask and the tables to analyse the data, and the *GCRMN Manual* for how to do it.

CASE STUDY: COMMUNITY BASED SOCIOECONOMIC MONITORING OF REEF RELATED ACTIVITIES IN AGATTI ISLAND, UNION TERRITORY (U.T.) OF LASHADWEEP, INDIA[1]

Vineeta Hoon[2]

Located at 10° 51' N and 72° E Agatti Island is the westernmost Island in the U.T of Lakshadweep, India. It consists of coral formations built up on the Laccadive-Chagos, submarine ridge rising steeply from a depth of about 1500 to 4000m of the west coast of India. The island covers a total area of 2.7 sq km, stretching 7.2 km in length. The local population of 7072 resides in the wider northern section of the island (see also Hoon et al. 2002[3]; Hoon and Tamelander 2005[4]). The traditional fishing and land rights areas of the people of Agatti include Kalpitti islet; the reef around Agatti, Perumal Par to the north west and the Bangaram lagoon that encompasses the Islands Bangaram, Tinnakara, Parelli I, II, and III. The past decade has witnessed a rapid change in the economy and social dynamics shifting from a traditional subsistence economy to a commercially oriented one.



The Community Based Socioeconomic Monitoring demonstration project was established in 2001-2002 with support from GCRMN South Asia. The aim of the project was to involve the local community in monitoring and research for the management of coral reef resources. The monitoring programme thus serves as a data collection and awareness-building programme in the islands. One is able to quantify the pressure on the reefs by various activities (some of which are banned by the administration). Being a civil society based programme, the local youth clubs and NGOs began to see the need for management action (Hoon et al. 2002). They serve as pressure groups for management, enforcement and conservation activities.

Thus the objectives of socioeconomic assessment were to:

- Facilitate stakeholder participation to understand the socioeconomic conditions of the islanders and relate them to the natural resource use and condition
- Determine how the stakeholders value the coral reef resources
- Identify threats and pressures
- Assess management effectiveness/community benefits and impacts of management strategies
- Establish a baseline of socioeconomic information
- Inform the Lakshadweep Administration and encourage the department of environment to develop a management plan
- Establish a community based monitoring context and developing a monitoring schedule

Reef Gleaning at Agatti island – a social pastime

To achieve these objectives, the Centre for Action Research on Environment Science and Society (CARESS) an environmental NGO based in Chennai, conducted a socioeconomic training workshop for community volunteers at Agatti Island and facilitated the formation of the Agatti Coral Reef Monitoring Network (ACRMN). During the training workshop the participants were provided with the *GCRMN Manual*. A 'learning by doing' approach was followed and the participants received hands on training in using PRA tools and visioning exercises. The focus was on understanding community livelihoods based on locally available bio-resources,

1 This study was carried out with the financial support of GCRMN SA and CORDIO

2 Managing Trustee, Centre for Action Research on Environment Science and Society (CARESS) and SocMon South Asia consultant for IUCN

3 Hoon V, Abdul Shukoor B, Moosa OG, Ayoob AE, Cheriyakoya, MI Mohammad Ali MC, Hajara A, Moosakoya B, Tajunnissa NM,and Aboobacker PP 2002. Socio-Economic Assesment & Monitoring of Coral Reefs of Agatti Island – UT of Lakshadweep - Project Completion report, CARESS, Chennai.

4 Hoon V and Tamelander J 2005. Community-Based Monitoring of Coral Reef Resource Use in Agatti Island, Union Territory of Lakshadweep, India. In: Souter D, Lindén O (eds.) Coral Reef Degradation in the Indian Ocean: Status Report 2005. Department of Biology and Environmental Science University of Kalmar

fishing effort, gear used, resource governance patterns, indigenous knowledge, site use, resource perceptions and people's perceptions of change and its cause and effect. The newly formed ACRMN came up with a monitoring context and plan as an output of the workshop. The following table summarises the data collection process for socioeconomic assessments:

Data collection phase	Time taken	What was done	
SocMon training workshop for community volunteers	2 weeks	Community team was trained in planning a socioeconomic assessment and in using PRA tools to carry out a socioeconomic assessment. Learning by doing approach was taken and the *GCRMN Manual* was provided to them as a reference.	
		Variables	**Actions/decisions**
Secondary data collection	1 week prior to the workshop and throughout the field work	• Island demography • Community Services • Fisheries landing, • Relevant notifications, legislations, research reports	Visited government departments libraries and research institutions dealing with the U.T. of Lakshadweep
Reconnaissance survey	2 days during secondary data collection	Introduction with community leaders, key authorities, and government departments, such as tourism, fisheries, harbour and port dept, welfare dept.	Introductory and informal discussions to introduce ourselves and plan the assessment work with key informants
Socioeconomic assessment using PRA techniques Gender was mainstreamed into the socioeconomic assessment and not dealt with as a separate variable	2 months	• Island Profile – use of local terminology for describing the island and coral reef ecosystem • Reef use patterns, traditional fishing, gleaning, commercial fishing, tourism • Traditional knowledge • Resource governance, customary laws • Perceptions of management authorities and needs • Market attributes extractive and non extractive • Stakeholder perceptions • Non-use value • Perception	Observation, transect, FGD, semi structured interviews at the household level and with key informants, questionnaire survey; Who does what in terms of age, gender and season; Visualisation techniques, resource mapping, seasonal calendar, ranking, household level survey for perceptions and income; Venn diagram; Problem tree analysis (participants were chosen randomly within their activity groups [e.g. fishers according to gear, fish traders according to products])
Material life style and survey	1 month	• Occupation structure and sources of income • Material life style • Perceptions of change	A questionnaire was developed to complement the SSI and FGD and focused on information that could not be quantified easily
Setting up a monitoring framework by community team ACRMN		• Monitoring reef related activities • Catch monitoring (spp size and weight) • Perceptions of change	Frequency – daily 10 days every alternative month 5 days every alternate year
Validation	2 days during the assessment period	Presentation of key learnings to influential stakeholders and the island Administration	On a needs basis

On the basis of the socioeconomic assessment, and in the absence of any formal management plan from the Lakshadweep Administration, the ACRMN came up with a monitoring context that would be useful for the community. The context was to measure the stress placed on the reef by human activity. They decided to monitor the number of people using the reef and lagoon for both livelihoods and recreation. To quantify the catch (fish, octopus, shells and coral boulders, rubble, sand) using different gears and the perceptions of the resource users with regard to the status of coral reef resources.

The data was analysed and a report prepared and submitted to relevant the departments of the Lakshadweep Administration. Subsequently, a case study was published in the Poverty and Reefs report by IOC/Unesco in 2002, and findings from the

monitoring have been published in the periodic CORDIO reports and newsletters. The ACRMN has organised workshops and seminars for the island community to publicise the key learnings from the reef related activity monitoring and to build consensus for establishing a no-take marine reserve in Agatti.

Socioeconomic assessments showed that:

- The matrilineal system known as marumukkatayam, was breaking down and the shariat law was gaining popularity for asset and property division. This law favours male over female inheritance (Hoon et al. 2002).
- The reliance on the reef fishery and gleaning for protein and income is high. 20% of the households on Agatti report reef fishery and gleaning as their main occupation, 90% of the protein intake of poor households comes from reef fishing and gleaning (Hoon 2003)[5].
- Sand, rubble and coral boulders remain important construction materials, and the perceptions of people that collecting rubble is not harmful to the coral reefs is in contrast with the notification that bans the collection of coral rubble and boulders (Hoon et al. 2002, Hoon 2003, and Hoon and Tamelander 2005).
- With regards to the perceptions on the condition of the reef 52% of the households surveyed felt that there was no change in the reef from the past. 40% of the surveyed households replied that they have no idea, and 10% felt that the reef was under threat due to increases in reef related activities and the consequent trampling, anchor damage and engine oil spills from boats (Hoon et al. 2002).
- Tourism is a growing industry, with resorts catering for both domestic and international tourists established on Agatti and Bangaram. A further resort is planned on Tinnakara, and a second air carrier started daily flights to Agatti in April 2007 (Hoon et al. 2005[6]).

The reef related activity and perceptions monitoring showed that:

- Attitudes towards dive tourism have changed and currently islanders think of tourism as a lucrative profession and are taking up dive certification to enable them to set up dive centres or work in one.
- Gear use around the island is largely determined by hydrography and how the gear is operated, as well as by habitat and availability of target species. Overall catch per unit effort (CPUE) was 1.66±0.07 kg per person per day based on data from 3030 fishing events (Hoon and Tamelander, in press[7])
- The total annual catch was estimated at over 61 metric tons, harvested from a lagoon area of 12 km2. Almost half of the total catch is obtained from only 2% of the catches, i.e. catches larger than 20kg. Most large catches are from more indiscriminate gears such as large-scale dragnets.
- The importance of the reef fishery for the local population (household income and food) remains high, and growth in the fishery seems likely in view of the demographic structure of the island as well as a developing reef fishery targeting napoleon wrasse, parrot fish, groupers and snappers for export markets (Hoon et al. 2005).

The socioeconomic assessment shows the diversity of aspects to take into consideration while designing a management plan. Formal management and gathering of catch data has focused on commercially significant activities such as tuna landings and paid little attention to subsistence fishing (Hoon and Tamelander 2005). This has left a gap in the environmental and resource management of Agatti and also a divide between local populations and the knowledge they possess on the one hand, and management authorities on the other. Socioeconomic assessment has been helpful for NGOs to plan livelihood strategies and communication strategies to build consensus for management action. This was evidenced by the independent action of the community in 2008, when the Agatti Islanders took a step forward by requesting the Lakshadweep Administration for designating a co-managed protected area at Agatti called the Agatti Conservation Reserve.

5 Hoon, V., 2003: A case study on Lakshadweep islands in Whittingham, E., Townsley P. and Campbell, J. eds. Poverty and Reefs: Vol 2 published by IOC/UNESCO

6 Hoon, V., Moosa, O.G., Cheriyakoya, M.I., Shamsuddin, V.M, Ayoob A.E., Hussain, S., Hajara, A., Moosakoya, B. and Tajunnissa, N.M., 2005. Community Based Monitoring of Reef Related Activity of Agatti Island – UT of Lakshadweep. Project Completion report, CARESS, Chennai. 62 pp

7 Tamelander J and Hoon V. 2008. The artisanal Reef Fishery on Agatti Island, Union Territory of Lakshadweep, India. In: Obura, D.O., Tamelander, J., & Linden, O. (Eds) (2008) Ten years after bleaching – facing the consequences of climate change in the Indian Ocean. CORDIO Status Report 2008. CORDIO (Coastal Oceans Research and Development, Indian Ocean)/Sida-SAREC. Mombasa. http//:www.cordioea.org. 400 pp.

SECTION 2: WHY SHOULD I DO THIS?

Socioeconomic information can be used by coastal managers for a number of goals. Once the relevant goals for monitoring have been determined the team can select the appropriate variables for data collection. *Section 4*, where the variables are introduced and the process of selecting variables is discussed, includes a table noting which variables are important to collect for each goal.

These goals are generic to the region. The coastal manager and monitoring team need to tailor these goals to the needs at their site.

2.1 ASSESSING SOCIAL/COMMUNITY RESILIENCE VIS A VIS REEF RESILIENCE.

Socioeconomic information and patterns of livelihood can show how resilient the local community is vis a vis the natural resource base. Climate change, bleaching, ocean acidification are currently being monitored by biophysical scientists to study reef resilience These changes have impacts on the livelihoods of the local reef dependent community and affect their welbeing. Helping people to understand the changing status of coral reefs, the causes and implications, and the opportunities for improvements is the first and perhaps most important step in building a strong consensus for the need for change. Without this consensus it will be very difficult to engage with the community in management initiatives. Understanding community resilience can help natural resource managers to factor in alternative livelihood solutions for the local community and thereby help reduce their reliance on natural resources for their subsistence.

2.2 MONITORING REEF RESOURCE USE ACTIVITIES AND THEIR IMPACT ON ECOSYSTEM GOODS AND SERVICE

"Stakeholder" refers to people who make direct use of the coastal resources as well as people whose actions may affect the coastal resources.

By collecting data on the extractive and non-extractive uses of coastal and marine resources, we can quantify the amount of catch extracted, or the number of people/stakeholders who benefit from the resources. Catch (fish, octopus, shells etc.) monitoring can be helpful in corroborating perceptions of changes in catch, species composition, size and weight of the fish caught. When carried out in combination with traditional knowledge and, househod interviews one is able to quantify the dependence on reef resources. Through activity monitoring, coastal resource managers can learn about the magnitude of impact on the coastal ecosystems by peoples activity and also identify threats, problems, solutions, and opportunities for coastal resource management. For example decrease in fish size and quantity or an increase in the number of people partaking in new activities, such as ornamental fish collection or switching from subsistence reef fishing to commercial reef fishing, can indicate potential threats from increased fishing effort and the need for management action. Such monitoring can be useful in directing biophysical monitoring to areas frequented by fishers as well as planning for livelihood enhancement or diversification.

2.3 TO UNDERSTAND PEOPLE'S PERCEPTIONS ABOUT REEF STATUS, USE AND CHANGE

Monitoring change in communities, among user groups and on coral reefs, from the perspective of resource users can help us understand the complex and ever changing relationships between people and coralreefs. The decisions that people and communities make regarding coral reefs and livelihoods will be based on their own perceptions of the changes that are happening and the impacts that they have had or may have in the future. People's perceptions of change and risk, are formed by their past experiences, the social and cultural environment that they live in and the information that they are able to access. Perceptions of the same events will often vary between individuals, groups and communities. These may or may not reflect scientific facts but are equally important when formulating policy and management decisions. Understanding people's perceptions is also a vital component in the process of building consensus around the need for change, understanding how people are likely to react to new scientific information and understanding how they may respond to new policy or management decisions.

2.4 DETERMINING THE IMPORTANCE, VALUE AND CULTURAL SIGNIFICANCE OF RESOURCES AND THEIR USES

Demonstrating the importance and value of coastal resources and services can help generate greater support for coastal resource management programmes. For example, an understanding of the value of coral reefs can be used to evaluate the benefits and costs of alternative development, management and conservation scenarios (e.g. a decision to allow diving in an area may be based on the expected occupations and income to the community from tourism activities).

2.5 ASSESSING POSITIVE AND NEGATIVE IMPACTS OF MANAGEMENT MEASURES

Determining the impacts of management decisions on stakeholders can help improve policy decisions to minimise negative impacts and maximise positive impacts to stakeholders. For example, a policy to restrict a certain type of fishing gear may affect occupational structure in the community and the market value of fish. By documenting the changes in occupational structure and market value before and after the policy is implemented, the managers can better determine the effects of the policy. Similarly, managers can use socioeconomic information to predict the effects of alternative policies on the community. For example, by knowing the number of people fishing various areas, managers can predict how many fishers will be displaced by a proposed no-take zone.

2.6 ASSESSING HOW THE MANAGEMENT BODY IS DOING (MANAGEMENT EFFECTIVENESS)

Measuring the effectiveness of coastal resource management programmes in achieving their goals and objectives is important for adaptive management. If a goal is to improve the participation of local stakeholders in the management process, people's perceptions of participation in decision-making need to be measured (e.g. perception surveys). Changes in this variable can indicate success or failure of the management activities and the possible need for a change in consensus building or enforcement activities.

2.7 BUILDING STAKEHOLDER PARTICIPATION AND APPROPRIATE EDUCATION AND AWARENESS PROGRAMMES

Socioeconomic information can be used to guide the incorporation of stakeholder group participation, concerns and interests into the management process. It can also be used to plan and direct education and awareness programmes for coastal resource management. For example, the identification of community and stakeholder organisations in the area can assist coastal managers in ensuring that critical stakeholders have opportunities to participate in the coastal resource management process.

2.8 ESTABLISHING BASELINE HOUSEHOLD AND COMMUNITY PROFILE

Information collected at the start of a coastal resource management programme establishes a baseline for future comparison, which is useful in adaptive management. As the goals and activities of the programme change, the manager can compare current conditions with the baseline to identify causes of changes as well as effects of change.

SECTION 3: WHAT'S INVOLVED?

3.1 WHO SHOULD DO THE MONITORING?

Monitoring can be undertaken by an individual, but ideally the socioeconomic monitoring will be conducted by a monitoring team led by someone from the coastal management staff (e.g. monitoring coordinator from marine protected area or fisheries authority, education officer from environmental organisation) with a background in one of the social sciences (i.e. sociology, anthropology, economics, political science, psychology, or geography). The involvement of a staff member in the socioeconomic monitoring is important for establishing long-term consistency and ensuring that the coastal management staff have access to the data for use in improving coastal management.

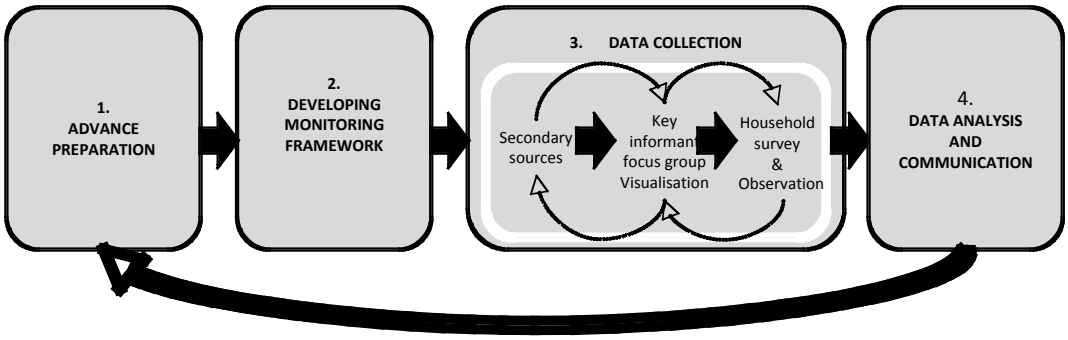
The team leader is responsible for planning the monitoring; collecting, analysing and presenting the data; and ensuring the programme continues over the long-term. The rest of the monitoring team assists with the data collection, particularly the interviews, analysis, report writing and presentations.

It would be ideal if the team members are from the community, trained in conducting interviews and in the use of PRA and visualisation techniques. This will increase the communities' involvement and interest, and will help build the relationship between resource users and managers.

If the leader and/or members have limited socioeconomic expertise, it is particularly important that they review the *GCRMN Manual*, which provides a comprehensive review of how to conduct socioeconomic assessments. The *GCRMN Manual, Chapter 1: Preparatory Activities, Identify the assessment team* also provides tips on developing the team.

3.2 WHAT IS THE PROCESS FOR DOING THE MONITORING?

There are generally four steps in conducting the socioeconomic monitoring, including:



1) Advance preparation, includes site selection, identifying goals of the socioeconomic monitoring, and identifying the monitoring team;
2) Building the monitoring Framework, which includes understanding community perceptions, community assessment and management objectives, selecting the key variables and defining the process to conduct the socioeconomic monitoring, identifying and consulting with stakeholders.
3) Data collection through secondary sources; key informants and focus groups using visualisation techniques, surveys and observation and;
4) Data entry, data analysis, communication and adaptive management (see *GCRMN Manual Chapter 4*)

This is an iterative process that needs to be repeated over time. New information may create new requirements, so the team should review progress and change plans to fit the new conditions, including modifying the list of variables for data collection and analysis.

3.3 WHAT IS NEEDED TO DEVELOP THE MONITORING FRAMEWORK

There are three aspects to be included in developing the monitoring framework: a) community assessment b) management objectives c) peoples perceptions. These aspects can be understood by spending some time with the community and conducting a rapid appraisal using participatory tools.

The monitoring framework is designed to be used by field workers at regular intervals to learn with the communities about their perceptions of the changes that are happening with coral refs and the peoples who depend on them. It is the core component in a three part processs that is designed to set the context for changes in the community

3.3.1 WHY IS THIS NEEDED?

The process of building a framework will help the monitoring team to select the variables for the SocMon, and understand how the information should be collected. In order to understand how to collect information, it is also essential that the monitoring team begin the process of developing a **strategy for communication** of the information generated by SocMon. Creating a communication strategy involves understanding clearly who the information is for, how they are going to use that information and, based on this, deciding what information is actually relevant for those users and what will be the best means and form of communication (for further guidance see section 5)

The contributions of the three aspects of the monitoring framework to the long term monitoring programme are described below.

Community Assessment

Teams will use a range of tools, which can include both participatory and more quantitative survey methods, to analyse the livelihoods of people in the community, the diversity of their livelihoods, community resources and changes that have happened in the community and the resources that they use (e.g. historic trends, environmental trends, regulatory changes etc).

This social and economic assessment will provide:

- An overview of the key changes within the community; and
- An understanding of the broader context for exploring the causes and implications of these changes in the reef and on the community.
- Stakeholders for the “key stakeholders focus group”.

Where this process is repeated as an ongoing monitoring activity, the work to understand the community context will just need to be validated and updated (rather than repeated in full) to ensure that the contextual information remains relevant to the community.

Management Objectives

The management team should clearly specify their objectives for the coral reef and the community. These objectives will be determined at different levels (local, national, international) and across different sectors (social development, conservation, economic development etc.). With respect to each of the objectives the management team will need to determine:

- The information required to achieve the objective;
- The information required to understand progress towards achieving the objective;
- The form that the information is required.

Perceptions

The research process requires field-teams to focus on the changes that have occurred both in the community and with the coral reef and is based around very simple semi-structured interviews with a series of representative groups. This process of analysing people’s perceptions of change is likely to generate issues of concern both for the community and for coral reef managers. These may include:

- **Conflicts between the peoples perceptions and acknowledged scientific fact:** Where the community either do not recognise a change in the reef (such as bleaching, or new regulation) or where people perceive the causes and impacts to be different to the accepted scientific “reality” it may be necessary to commission further research or monitoring to clarify the situation and then to inform and influence the community about the reality of the situation.

- **Identifying new changes and trends:** It may be that the community recognises changes in the reef or in their livelihoods that have not been realised by managers or scientists. In this case further scientific exploration or management interventions may be required.
- **Level of consensus around the need for change:** It may be that the community recognize the changes that are occurring with the reef and the pressures on this but they may not see a need to change their actions, perhaps because they see not alternative or perhaps because the do not see that how they are affected by the changes.

3.4 HOW DO I COLLECT THE DATA?

The variables presented in *SocMon* are divided into five main methods of data collection:

1. Secondary sources (Sec)
2. Key informant (KI) /focus groups interviews (FGI)
3. Surveys
4. Observation
5. Visualisation with community participation

Generally, data should be collected from secondary sources first, followed by key informant interviews and/or focus groups using PRA and visualisation techniques. If data collected on the key informant and secondary variables are sufficient to meet the team's goals, then there is no need to conduct surveys. Observation is on-going while in the community. These methods are discussed in detail in the *GCRMN Manual, Chapter 3: Field Data Collection*.

The team should adhere to the following guiding principles throughout the data collection:

- respect the stakeholders and community, such as work schedules, local customs, and religion
- recognise informant biases
- address gender issues
- reach less accessible areas
- address language differences (e.g. have interpreters)
- take detailed notes.
- cross check information

3.4.1 SECONDARY SOURCES

The monitoring team should start by conducting a thorough assessment of all relevant secondary data on the identified variables. Secondary data are those that have already been collected, analysed and published in various forms, including:

- official and unofficial documents
- statistical reports
- reports of previous assessments and surveys
- research reports
- documentation of previous or ongoing projects, including monitoring and evaluation reports
- maps
- aerial photographs and satellite images
- historical documents and accounts
- Web sites on the Internet.

The assessment of secondary data involves compiling, evaluating and reviewing the data related to the variables.

3.4.2 KEY INFORMANT AND FOCUS GROUP INTERVIEWS

Key informants are individuals whose experience and/or knowledge can provide insight and information into the larger population and/or a particular group. For example, a village head or community leader can provide insight into the entire community and the customary laws accepted by the community, an acknowledged expert fisher is a source of traditional knowledge on ecosystem health and fisheries in the neighborhood, similarly an expert octopus collector can provide information on octopus hunting grounds and octopus status. Key informants can therefore provide common knowledge, shared knowledge and specialised knowledge. For example, to determine whether there is a fisheries management plan, the team can ask the Fisheries Office Director. Most of the variables collected using key informants address basic facts (e.g. demographics of the community, existence of a formal management body). It is important to interview several key informants to gain a breadth of perspective. A rule of thumb to

determine when enough key informants have been interviewed regarding a particular variable is when the answers to the same questions become repetitive.

Focus Group Interviews (FGIs) involve a selected group of informants (usually 4 to 10) who share a common background or knowledge (e.g. use patterns, language, organisation membership). FGIs are usually based on a set of discussion points. This flexible method allows the facilitator to probe for answers, and follow-up the original questions and pursue new lines of question during the interview. The flexibility and openness of this method encourage two-way interaction, including exchanges of information between the facilitator and the informants. Grouping informants together can, if facilitated well, provide more precise information at one time than one key informant.

3.4.3 HOUSEHOLD INTERVIEWS/SURVEYS

Surveys are used for understanding households' and individuals' perspectives. For example, if the team wants to understand what people think about coastal management practices, then it needs to ask a spectrum of people. Most of the variables studied through surveys address perceptions (e.g. non-market and non-use values, perceived community problems).

The *SocMon* survey guide is structured with the intention that the respondent speaks on behalf of his or her household. The results, therefore, will be at the household level. However, if the team is interested in the individual level, they can modify the questions to ask about the individual perspective. For example, for the variable *Marine activities*, the respondent could be asked to identify all his or her uses of coastal and marine resources (not uses by household members).

There are many definitions of a household. It is important to define **what a household is** at the beginning of the monitoring and stick to this definition. A household can consist o a nuclear family or an extended family living under one roof. A common definition is 'the cooking pot' definition that is 'the people eating together and sharing income'. It is important to agree on the definition with informants prior to interviewing them.

To obtain more depth on some of the variables, it may be useful to include some open-ended semi-structured questions. These questions may be added directly into the interview guides. To develop these questions, it may be useful to consider "who, what, when, how and why". For example, the variable *Use patterns* asks where resource use activities occur. Follow-up semi-structured questions could include: "Where are the best places for reef fishing?" and "Where do you sell this fish?" (see *GCRMN Manual, Chapter 3, Semi-structured Interviews).*

3.4.4 OBSERVATION

Observations are qualitative and sometimes quantitative descriptions of what the team member sees, and are obtained by attentively watching and recording the surroundings. For example, a team member may collect information on material style of life by observing a respondent's house and noting roof, wall, floor and window construction materials. Observation is a useful method because the team can learn first-hand information about complex activities, such as fishing patterns. Much of the behaviour involved in these activities is learned non-verbally by observing and doing. For example fishermen may only state that they fish twice a day, but through observation we may come to discover that this involves a range of activities, including line fishing, netting, and octopus hunting using a boat. Observations are conducted throughout the field data collection although observations at the start of data collection are particularly useful to prepare interview and survey questions.

3.4.5 VISUALISATION

Techniques for visualisation and diagramming relationships in data include maps (resource activity, social etc.), transects, timelines, seasonal calendar, matrices, historical transects, decision trees, Venn diagrams and ranking. These techniques are used to gather and present large amounts of complex information in a clear and concise, graphic and easily understood format. These techniques are analytical tools used during field data collection, particularly during semi-structured and focus group interviews. They can also be used during oral histories, surveys and observations to enable the informants to visually articulate information (see *GCRMN Manual, Chapter 3, Visualisation techniques*). Most people are visual learners and understand and express better when they see a diagram analysing the discussion. *Visualisation* also helps when words/concepts are lost in translation. They are particularly useful in monitoring because one can refer to a base map, transect seasonal diagram etc. prepared during the base line and easily note the changes that are taking place vis a vis the coastal and marine goods and services spatially.

3.5 WHO SHOULD BE INTERVIEWED FOR THE SURVEYS?

The monitoring team should develop its own sampling approach to determine whom to interview for the surveys. The *GCRMN Manual, Appendix B: Sampling Approaches* provides a comprehensive explanation of how to select the appropriate *number of people* to interview and how to identify *the people* to interview (both randomly and non-randomly). The selection of survey respondents will depend on monitoring goals. For example, If the goal were to understand general community perceptions about coastal issues, then a sample of households/ individuals would be surveyed.

An important decision is whether to interview a random or non-random sample of people. This decision will depend on whether the results need to be statistically representative of the community. If they do, then it is important to collect a statistically representative sample of people through random sampling (see the *GCRMN Manual, Appendix B: Sampling Approaches, p. 233,* for a sampling table*)*. The more statistically significant something is, the less likely it happens by chance. However collecting a statistically representative sample can be very expensive and time consuming, and the need for statistical representation will need to be weighed against the reality of staff, time and funding constraints.

In cases where the team does not need a statistically representative sample of the population, then smaller sample sizes may be used. Although not statistically representative of the entire population, the results can provide a useful understanding of the population. In these cases, the following sample sizes are suggested:

Population	Sample Sizes
100	25
200	40
300	60
400	70
500	80
1000	100

For non-random sampling, it is important to sample from the different types of stakeholder groups to ensure the breadth of perspectives are assessed. The information collected from the secondary sources and key informant interviews can be useful for ensuring the breadth of people in the community is interviewed. The secondary and key informant data will include information on the different types of stakeholders in the community as well as distribution of basic demographics, including age, gender, education, ethnicity and economic status. The team needs to interview people in approximately the same proportions from these groups. For example, if there are 50% fisher households, 30% service and 10% gleaners 10% businessmen in a community, then the team needs to conduct interviews with approximately these same percentages of people.

3.6 HOW LONG SHOULD THE MONITORING TAKE?

The time it will take to conduct each socioeconomic assessment will vary depending on the situation, including the size of the community, skills and resources of the team, size of the team and number of variables selected. The first time will generally take the longest, since the process is new and the list of variables may be longer than those selected for future monitoring. Overall, it is generally estimated it will take between 3 and 6 weeks (17 to 30 actual working days) to conduct the monitoring as follows:

Preparatory activities: 3 - 5 days

Data collection through secondary sources: 3 - 5 days

Data collection through key informants and/or focus groups: 3 - 5 days

Data collection through surveys: 5 - 10 days per survey

Data collecton on catch quantity – 10 days every alternate month (**note: this information may need to be collected on a time scale that exceeds the SocMon project period.**

Data entry: 3 - 5 days per survey

Data analysis, report writing, presentations and consultations: 5 -10 days

These actual working days may be spread out over a longer period, as each activity may not follow directly after the other.

3.7 HOW MUCH WILL THE MONITORING COST?

The budget will also vary depending on site needs, existing resources and local costs. Generally it is expected that the budget items will include, but not be limited to:

- travel to field site
- transportation to government offices for collection of secondary data
- salary for 3-4 interviewers
- pen, paper, notepads, other office supplies
- maps, nautical charts
- transportation to study area (car, boat)
- photocopying
- computer with basic word processing software
- personnel time for data entry, database management and organising on computer and in files.
- optional: camera, binoculars, tape recorder, video camera, Geographic Position System

3.8 HOW OFTEN SHOULD THE MONITORING BE DONE?

Typically a socioeconomic monitoring programme begins with a baseline socioeconomic assessment using the full range of variables, which provides a foundation of data for future reference. The subsequent monitoring efforts may involve a shorter list of variables than the baseline monitoring, as some variables should be collected on a more frequent basis than others. *Tables 4.1* and *4.2* in *Section 4*, where the variables are introduced, give suggested frequency of data collection for each variable that ranges from a minimum of every 2 to 5 years. The team will need to determine the most appropriate frequency depending on the situation and data needs for its site.

Seasons strongly affect marine and coastal activities in South Asia. This will have to be taken into consideration in the monitoring and it may be appropriate to monitor some of the variables in different seasons, for each monitoring cycle (e.g. use patterns, activities).

3.9 WHERE SHOULD THE MONITORING TAKE PLACE?

The data collection will generally take place in two places:

- Outside of the study area – the secondary source data is typically located in government, academic, research, non-government organisation and other offices, which are usually outside of the study area.
- Inside the study area– the surveys, observations and majority of key informant interviews and focus group interviews will be conducted in the study area.

3.10 WHAT IS THE AUDIENCE FOR THE RESULTS?

In determining the audience, it is important to consider who will be affected by the results, both positively and negatively. Who is affected may depend upon the goals of socioeconomic information as discussed in *Section 2.* For example, if the purpose of the monitoring is to assess the management body's performance, then the management body will be the audience as well as anyone else who is interested in its effectiveness, such as the agency overseeing the management body (e.g. the Ministry of Environment), the general public and particular stakeholder groups (e.g. fishers, tourism operators).

It is also important to consider who can take action related to the results. For example, if the goal is to build stakeholder participation, then the stakeholders are an important part of the audience.

Finally, it is important to consider who needs to be kept informed of coastal management activities and the related socioeconomic conditions. In some cases this may be the entire community, in other cases particular government agencies or advisory boards.

3.1.1 WHAT ELSE SHOULD I KNOW?

It is important to identify any development projects or studies that have been conducted recently that may have included a socioeconomic assessment. The process and resulting information should be reviewed as data for comparison and before starting *SocMon* data collection to prevent duplication. If there are any on-going activities in the area conducting a socioeconomic analysis, it is important to determine if the analysis is relevant to the *SocMon* monitoring and attempt to integrate or merge the activities. This is particularly important to minimise intrusion into communities. It is not uncommon for community members to get interview fatigue from being interviewed too much.

As noted in *Section 1*, this document is designed to be used in conjunction with the *GCRMN Manual.* It is particularly important to review *Chapter 1: Preparatory Activities* and *Chapter 2: Reconnaissance and Planning* before starting the data collection. *Chapter 3: Field Data Collection* is also critical for understanding how to conduct interviews.
These guidelines or the GCRMN Manual is **not** a substitute for training, experience and skills in community engagement and socio-economic monitoring. This is one reason why MCPA managers, however experienced they may be in natural resource management issues, are encouraged to seek out well-qualified and experienced community specialists to work with them. Preferably, they should seek out organisations or practitioners who know the communities they are working with well and are already well respected by them. Even if they do not have specific experience with socio-economic monitoring in respect to coral reefs such practitioners should recognise many of the elements within the approach and be able to take on board the key principles underlying it.

SECTION 4: WHAT DATA DO I COLLECT?

4.1 WHAT ARE THE VARIABLES?

SocMon is focused on socioeconomic variables, which are presented in *Table 4.1*. and 4.2. *Appendix A* provides detailed information on each of the variables, including what it is, how to collect it, how to analyse it, and how the resulting information can be useful to managers and stakeholders. For more extensive descriptions of these variables and how to conduct interviews see the *GCRMN Manual, Appendix A: Socioeconomic Parameters* and *Chapter 3: Field Data Collection, Semi-structured Interviews, Focus Group Interviews, and Visualisation Techniques*.

To set the goals/context for the data collection, the team first needs to develop an understanding of the study area, stakeholders, population, number of households, and activities. *These variables may be more fully assessed during the interviews.*

A few of the variables, such as age, gender and education, are collected through key informants/focus groups/secondary sources as well as through surveys. This is done to cross-check the results and also because the two sets of data complement each other. Some variables, such as resource use patterns, can be collected using complementary methods, such as visualisation techniques, observations and FGIs. Other variables such as occupation and sources of income can be cross checked through surveys, observation and key informant interviews. The key informant/focus groups and secondary source data provide community-level, aggregate information useful for assessing changes and trends over time; whereas, the survey data provide more precise information on the households and individuals in the study area. For example, the community level information on occupation and demographics provides an overall understanding of the percentage of the community that is employed in each occupation and what percentage of the community is in what age group, level of education etc. In contrast, survey information on occupation and demographics can be used to determine the quality of life of the stakeholder such as subsistence fishers or tour guides.

For the first assessment, the team may need to collect data on more variables than for the subsequent monitoring. Typically a baseline assessment is conducted using a full range of variables that provides a foundation of data for future reference. The subsequent monitoring may involve a shorter list of variables than the baseline monitoring since some variables should be collected more frequently than others. See *Tables 4.1* as a reference for when to collect data on which variables.

Observation is not specifically noted for any of the variables because it is important for all of them. The monitoring team is expected to use observation as a preliminary means of gaining an understanding of the study area and as a cross-check on the data collected through the secondary sources, key informant interviews and surveys.

For the survey variables it should be noted that the first half of the variables ask about the respondent's household demographics and coastal and marine activities while the second half ask about the respondent's individual perceptions. This is done to gain as much information as possible about the community from the respondent while realising that the respondent can only accurately speak regarding his or her perceptions, not those of the other household members.

Tables 4.1 and 4.2 list the variables according to category and means of data collection. The tables note particularly useful aspects of each variable, including the main means of data collection, minimal frequency of data collection and general importance of data collection.

TABLE 4.1 KEY INFORMANTS/SECONDARY SOURCE VARIABLES

Key Informant Interviews/ Secondary sources		Main means of data collection (secondary Sec, key informants KI, observation O, visualisation V, or survey S)	Minimal frequency of data collection	General importance of data collection
Community level demographics				
K1	Study area	Sec	5	Medium
K2	Population	Sec	5	High
K3	Number of households	Sec	5	High
K4	Migration rate	Sec	5	Medium
K5	Age	Sec	5	Medium
K6	Gender/sex ratio	Sec	5	Medium
K7	Education	Sec	5	Medium
K8	Literacy	Sec	5	Medium
K9	Ethnicity/caste/tribe	Sec	5	Medium
K10	Religion	Sec	5	Medium
K11	Language	Sec	5	Medium
K12	Occupation	Sec	5	High
Community infrastructure, business development and ownership – note show linkages to coastal and marine ecosystems for all variables)				
K13	Community infrastructure, business development and ownership	Sec/KI/O	5	Medium
Coastal and marine activities (incorporate gender in all activities and analysis)				
K14	Activities	All	1	High
K15	Goods and services	KI/O	1	High
K16	Types of use	KI/O/Sec source	1	High
K17	Value of goods and services	KI/O/Sec source	1	High
K18	Target markets for goods and services	KI/Sec source	1	High
K19	Traditional knowledge	KI/Oral history	1	High
K20	Use patterns	KI/O/V	1	High
K21	Activity location	KI/O/V	1	High
K22	Seasonality	KI/O	1	High
K23	Levels and types of impact	KI/O	1	High
K24	Level of use by outsiders	KI/O	1	High
K25	Household use	KI/sec source/O	2	High
K26	Stakeholders	KI	1	High
K27	Tourist profile	Secondary sources	3	Medium
Governance, institutions and decision making bodies				
K28	Management body	Sec/KI	3	Medium
K29	Management plan	Sec/KI	3	Medium
K30	Enabling legislation	Sec/KI	3	Medium
K31	Management resources	Sec/KI	3	Medium
K32	Formal tenure and rules	Sec/KI	3	Medium
K33	Informal tenure and rules, customs and traditions	Sec/KI	3	Medium
K34	Community incentives	Sec/KI	3	Medium
K35	Stakeholder participation and satisfaction	Sec/KI	3	Medium
K36	Community and stakeholder organisations	Sec/KI	3	Medium
K37	Power and influence	Sec/KI	3	Medium

TABLE 4.2 HOUSEHOLD INTERVIEW VARIABLES

	Survey	Minimal frequency of data collection in years	General importance of data (high or medium)
Household demographics			
S1	Age	5	Medium
S2	Gender/sex ratio	5	Medium
S3	Education	5	Medium
S4	Ethnicity/caste/tribe	5	Medium
S5	Religion	5	Medium
S6	Language	5	Medium
S7	Occupation	5	Medium
S8	Household size	5	Medium
S9	Household income sources	5	Medium
Coastal and marine activities (provide linkages to the coastal and marine goods and resources in the analysis)			
S10	Household activities	2	Medium
S11	Household goods and services	2	Medium
S12	Types of use	2	Medium
S13	Household market orientation	2	Medium
S14	Household uses	2	Medium
Attitudes and perceptions, and participation in formal informal institutions			
S15	Non-market and non-use values	3	Medium
S 16	Perceptions of resource conditions	3	High
S17	Perceived threats	3	High
S18	Awareness of rules and regulations	3	Medium
S19	Compliance	3	Medium
S20	Enforcement	3	Medium
S21	Participation in decision making	3	High
S22	Membership in stakeholder organisations/institutions	3	Medium
S23	Perceived coastal management problems	3	High
S24	Perceived coastal management solutions	3	Medium
S25	Perceived community problems	3	Medium
S26	Successes in coastal management	3	Medium
S27	Challenges in coastal management	3	Medium
Material style of life			
S28	Material style of life	3	Medium
S29	Level of poverty	3	High

TABLE 4.3 GOALS/CONTEXTS OF SOCIOECONOMIC MONITORING AND RELEVANT VARIABLES

	Community level demographics														Coastal and marine activities														Governance								
	Study area	Population	Number of households	Migration rate	Age	Gender/Sex ratio	Education	Literacy	Ethnicity/Caste/Tribe	Religion	Language	Occupation	Community infrastructure, business development and ownership	Activities	Goods and services	Types of use	Value of goods and services	Target markets for goods and services	Traditional knowledge	Use patterns	Activity location	Seasonality	Levels and types of impact	Level of use by outsiders	Household use	Stakeholders	Tourist profile	Management body	Management plan	Enabling legislation	Management resources	Formal tenure and rules	Informal tenure	Community incentives	Stakeholder participation and satisfaction	Community and stakeholder organisations	Power and influence
Goals/context	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12	K13	K14	K15	K16	K17	K18	K19	K20	K21	K22	K23	K24	K25	K26	K27	K28	K29	K30	K31	K32	K33	K34	K35	K36	K37
Assessing social/ community resilience vis a vis reef resilience	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x
Monitoring coastal and marine activities and their impact on ecosystem goods and services provided																																					
quantifying pressure on the reef by different activities	x	x	x											x	x	x		x	x	x	x	x	x	x	x	x	x											
quantifying extractive use	x	x												x	x	x		x	x	x	x	x	x	x		x												
Reef conservation and action from peoples perspective																																					
Changes in the way people use resources													x	x	x	x	x	x	x	x	x	x																
Changes affecting the ecosystem and resource use				x			x							x		x	x	x	x	x	x	x	x	x		x		x	x	x		x	x	x	x	x	x
How has the change affected people				x			x				x		x	x	x	x		x	x	x	x	x		x		x								x	x	x	x
What action has been taken to deal with these changes														x														x	x	x		x	x	x	x	x	x

Determining the importance, value and cultural significance of resources and their uses																																					
Importance/value	x											x		x			x	x						x	x	x									x	
Cultural significance	x																																	x			
Assessing positive and negative impacts of management measures																																					
Livelihoods		x					x	x	x		x		x	x	x	x	x		x	x					x											
Marketing and production												x	x				x	x		x																
Food security																	x	x		x					x											
Attitudes and perceptions																																					
Coastal activities												x		x	x	x		x	x	x																
Governance																													x	x	x	x	x	x	x	x	x	x
Assessing how the management body is doing																																					
Management effectiveness														x		x			x	x									x	x	x	x	x	x	x			
Building stakeholder participation and appropriate education and awareness programmes																																					
Stakeholder participation		x			x	x	x	x	x	x	x	x		x			x	x	x	x					x			x							x	x
Awareness programmes				x									x	x		x		x	x	x	x				x		x									
Establishing baseline household and community profile	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x

TABLE 4.3 GOALS/CONTEXTS OF SOCIOECONOMIC MONITORING AND RELEVANT VARIABLES SURVEY VARIABLES

	Household level demographics									Coastal and marine activities							Attitudes and perceptions and participation in formal Informal Institutions											Material style of life	
	Age	Gender/Sex ratio	Education	Ethnicity/caste/tribe	Religion	Language	Occupation	Household size	Household income sources	Household activities	Household goods and services	Types of use	Household market orientation	Household uses	Non-market /non use values	Perceptions of resources conditions	Percieved threats	Awareness of rules and regulations	Compliance	Enforcement	Participation in decision making	Membership in stake holders organisations	Percieved coastal management problems	Percieved coatal management solutions	Percieved community problems	Successes in coastal managemnet	Challenges in coastal management	Material style of life	Levels of poverty
Goals/context	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29
Assessing social/ community resilience vis a vis reef resilience	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			x	x
Monitoring coastal and marine activities and their impact on ecosystem goods and services provided																													
Quantifying pressure on the reef by different activities										x	x	x	x			x	x	x					x	x	x			x	x
Quantifying extractive use										x	x	x	x			x	x	x					x	x	x				x
Reef conservation and action from peoples perspective																													
Changes in the way people use resources	x	x	x				x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Changes affecting the ecosystem and resource use																x	x	x	x									x	x
How has the change affected people							x		x	x	x	x	x	x	x													x	x
What action has been taken to deal with these changes																		x	x									x	x
Determining the importance, value and cultural significance of resources and their uses																													

Importance/value							x		x				x																
Cultural significance																													
Assessing positive and negative impacts of management measures																													
Livelihoods			x	x	x		x			x	x	x	x	x														x	x
Marketing and production											x	x	x	x															x
Food security											x	x	x	x															x
Attitudes and perceptions															x	x	x	x	x	x			x	x	x	x	x		x
Coastal activities							x			x	x	x					x												x
Governance																				x									x
Assessing how the management body is doing																													
Management effectiveness										x	x	x															x	x		
Building stakeholder participation and appropriate education and awareness programs																													
Stakeholder participation	x	x	x	x	x	x	x					x					x	x	x		x	x					x	x		x
Awareness programs										x	x	x			x	x	x	x											x
Establishing baseline household and community profile	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

4.2 WHICH VARIABLES DO I USE?

If it is not possible to assess all of the variables in *SocMon*, then it is recommended that the monitoring team prioritise variables based on the following considerations:

4.2.1 GOALS/CONTEXT OF THE SOCIOECONOMIC INFORMATION

Most important, the team needs to clarify why the data is being collected, and specifically how it will be used once collected. For example, if the team is most concerned about identifying threats, then it might focus on the variables listed for identifying threats. ***Section 2* discusses the various goals/contexts of collecting socioeconomic information.** The variables prioritised for data collection in *SocMon* were selected because they address these goals. *Table 4.3* notes which variables are relevant to which goals/contexts so that the team can easily identify which variables are relevant to its needs. A discussion of how the variables can be used to understand each of these goals/contexts is provided in the *How the information can be useful to managers and to other stakeholders* section of each variable in *Appendix A.*

4.2.2 GENERAL IMPORTANCE OF DATA COLLECTION

It is agreed that all the demographic variables listed are of importance, and if the data exist, they should be monitored if possible. If reliable information does not exist on demographics, and resources need to be prioritised, the managers should focus on variables directly relevant to his/her established management goal. In some cases the goals of the socioeconomic monitoring may not be clear and available time and resources may not allow the team to assess all the variables. For these situations a * indicates variables considered to be the most important variables to collect if monitoring resources are limited and only a subset can be measured, based on 1) usefulness to management, 2) ease of data collection, and 3) likelihood of providing new information.

4.2.3 SITE-SPECIFIC CONDITIONS

Perhaps most important, the team needs to select variables based on local issues of importance in the study area. For example, if waste management is an important issue, then the team may want to prioritise community infrastructure and add more questions specific to waste disposal practices.

The team also needs to consider expected future changes in management and in the community. For example, if tourism is increasing, then the team may want to add more questions related to the tourism industry and its impacts.

Tables 4.1 and 4.2 list the indicators according to category and means of data collection. The tables note particularly useful aspects of each indicator, including the main means of data collection, minimal frequency of data collection and general importance of data collection. Observation is not specifically noted for any of the indicators because it is important for all of them. The monitoring team is expected to use observation as a cross-check on the data collected through the secondary sources, key informant interviews and household interviews. Table 4.3 is aimed at helping managers to prioritise variables to monitor according to the goals and aims of the site's coastal and marine resources management.

SECTION 5: WHAT DO I DO WITH THESE DATA?

5.1 ANALYSIS

The data analysis is typically conducted as a team. Throughout the data collection the team should meet several times to review and validate the data, discuss and refine key learning, interpret the results, validate the key learning and plan communication of results. As a result, much of the data analysis, particularly of qualitative data, should be completed during the field data collection. The final analysis at the end of the data collection will be to review and finalise the field analyses.

Key learning refers to issues identified or lessons learned by the team that are essential to the goals of the monitoring or are needed to understand the socioeconomic context of the stakeholders. *See GCRMN Manual, Chapter 4: Final Data Analysis* for more information on key learning and basic principles for analysis.

There are several critical steps the team should conduct together for the data analysis:

1. ***Compile all the data*** by gathering all the completed secondary sources and key informant interview guides and survey guides.
2. ***Prepare the data*** by transferring the collected secondary source, key informant interview and survey data to the analysis sheets.
3. ***Interpret the data*** by reviewing the results from the analysis sheets to identify and organise information related to the originally identified goals of the socioeconomic monitoring (see *Section 2*). These data then need to be reviewed, correlated and contrasted to identify emerging patterns and trends. These patterns and trends become a **key learning**. The results are then compiled to identify data that support the key learning. For example, if the goal of the monitoring is to identify socioeconomic impacts of a no-fishing regulation, then two of the variables of interest are occupation and activities. For the analysis, there may be trends in changes in occupations and activities as people shift from fishing to other occupations and activities. If there are shifts out of fishing, a key learning may be that the regulation has had an impact on fishing activities as demonstrated by people leaving fishing as an occupation. The results on occupation and activities would support this key learning. By reviewing, correlating and contrasting these different pieces of data, it is possible to identify changes in each of the variables. For each variable there is a discussion of how to analyse and use the information in the *How to analyse the data* and *How the information can useful to managers and other stakeholders* sections in *Appendix A*.
4. ***Agree on key learning*** by agreeing on the most important key learning to highlight, and selecting the information to support the key learning.
5. ***Validate the findings*** by discussing the key learning with stakeholders as part of communication discussed below. Any noticeable differences should be checked with original sources.

5.2 COMMUNICATION/FEEDBACK

The **most important** aspect of the entire monitoring process **is to communicate the results** related to the goals back to the audience. This involves discussing the findings with the audience, seeking feedback and validation, and seeking appropriate decisions and actions to make use of the results. This communication process is critical to adaptive coastal management, which uses the information to improve the way management will be done in the future. For example, if the goal of the socioeconomic monitoring is to understand the value and importance of coral reefs, then the results regarding people's perceptions of non-market and non-use values can be used to understand value and importance. If the results show that more and more people have positive perceptions of the value of protecting coral reefs, then this demonstrates a high value of coral reefs. This information can then be used by the manager to demonstrate to the public and to policy-makers, the importance of putting resources into protecting the coral reefs.

As discussed in *Section 3.3 and 3.9*, the audience may range from community members to policy-makers and coastal resource managers. From an ethical standpoint, it is recommended that the results of the socioeconomic monitoring be reported back to the community even if they are not the target audience. This is done as a courtesy to the community members who provided their

time for the interviews. Interview fatigue is a serious concern in any socioeconomic monitoring effort and the more people are involved in the process and have access to the results the greater people's willingness to participate in subsequent monitoring activities. It is therefore important to discuss with community members how the results will be used and how they will affect management. The monitoring will also be useful to the communities directly, especially by giving them an opportunity to give feedback, approve, or evaluate policies or projects, which have affected them.

When determining which results to highlight and share with the audiences, the team needs to consider what it expects each audience to do with the results presented to them, including actions it expects them to take. It also needs to consider the critical pieces of information that each target audience will be looking for from the results.

5.2.1 COMMUNICATION MECHANISMS

The results of the socioeconomic monitoring can be communicated to the various audiences through both one-way and two-way communication mechanisms. One-way communication mechanisms include:

- written material (report, papers)
- visual material (posters, pictures)
- oral presentations
- mass media (newspapers, magazines, radio, television)
- web sites

Two-way communication mechanisms include:

- public/village meetings
- group discussion
- one-on-one discussion
- remote communications (telephone, video phone, Web camera)
- e-mail

Two-way communication mechanisms have the benefit of bringing the audience into the monitoring process by allowing them to provide feedback on the findings. If they have a mechanism for being involved, then they are more likely to support and take action related to the results.

When deciding which mechanisms to use, the team should consider the following questions:

- What is their preferred method of receiving information? This may be closely related to their educational level and technological capacity. The literacy rate is important to consider as well as whether they prefer to read information, listen to a radio or watch television. Are they computer literate? Do they use the Internet regularly? Do they gather together periodically at meetings or conferences? If so, when?
- Do they prefer technical or academic prose to that of a more casual, conversational style? Where and how are spoken communications typically conducted? What language is used?
- Do they prefer 'village meetings' or public meetings such where there is an opportunity for open dialogue? What language is used in these meetings? Who should be present?

If there are marginalised or disadvantaged groups in the area, it is especially important to develop a communication process to meet their special needs, such as holding special group discussions with them.

5.2.2 WRITTEN REPORTS

If the results are going to be communicated in a written form, then a report is presented for the target audience. The report can take several forms depending upon the audience for the report. Some end-users, such as senior policy-makers or decision-makers, may have little interest in a general description of the area and communities studied, but may be interested in issues, problems and potential solutions. Other end-users, such as researchers, development agencies planning to work in the area and coastal resource managers, may want detailed descriptions of all socioeconomic conditions and factors relating to coastal resource stakeholders.

Typically, the report should include:

Executive summary – a summary discussion of issues, problems, opportunities and solutions identified in the monitoring.

Introduction/background information – a discussion of the major and specific goals of the socioeconomic monitoring (related to the different uses of socioeconomic information presented above) and some background on the biological, physical, social, economic and political characteristics of the area.

Goals and objectives – include the goals and objectives of the socioeconomic monitoring or assesment

Methods – a discussion on the sampling methods, the data collection methods, and the qualitative and quantitative data analysis methods used.

Results – a presentation of the main results from the monitoring effort including tables, diagrams, correlations between variables and a narrative discussion. The specific results that may be presented for each variable are noted in the analysis sections for each variable in *Appendix A* and in the *Analysis Sheets* in *Appendices D* and *E*.

Conclusion – a discussion on key learnings and implications from the results organised around the originally identified goals of the monitoring.

Recommendations – recommended management actions and potential solutions to be undertaken as a result of the monitoring.

References

Appendices – 1. Copies of the full survey instrument(s) used (e.g household survey sheet)
2. Full results, including summary statistics for all questions asked.

5.3 ADAPTIVE MANAGEMENT

The results of *SocMon* should be used for adaptive management, a process that emphasises learning by doing and feedback, and links the progressive accumulation of information and knowledge with management. Adaptive management consists of using socioeconomic information to review the results of management actions taken in the past and assessing whether these actions have produced the desired results. Based on this assessment, necessary changes are made in management plans to improve the way that management is done in the future. For further discussion, see *How the information can be useful to managers and other stakeholders* sections within each variable description in *Appendix A*. Table 5.1 summarises what the socioeconomic monitoring team has to think about in order to ensure the most effective uptake of *SocMon* findings for adaptive management. This table will help the socioeconomic monitoring team plan a communication strategy for the monitoring findings.

Table 5.1. A framework for communication and adaptive management

Who needs to be informed of *SocMon* findings and their implication for planning, management, policy?	What needs to change or not?	What is the best media to use?	Does this media already exist?	Resources required?

APPENDIX A: THE VARIABLES

Section 4 provided a brief listing of the SocMon variables. This appendix describes each variable, including:

What it is - description of the variable

How to collect the data – description of how to collect the data (e.g. type of key informants, sources of secondary data) and relevant interview questions that are all compiled in *Appendix B* and *Appendix C*. In some cases a section, *Additional data collection,* is provided suggesting additional information that may be useful to collect.

This appendix describes the full set of variables that may be monitored. From this set the monitoring team needs to select the variables appropriate for its goals and site conditions as discussed in *Section 4*

How to analyse the data – explanation of what to do with the data, including comparisons to make with other data and the tables or narrative text to prepare, which are compiled in *Appendix D* and *Appendix E*. In most variables a section, *Additional analysis,* is provided noting analysis that can be done beyond what is included in the *Appendices D & E* analysis sheets.

How the information can be useful to managers and other stakeholders – discussion of how the information can be useful relating back to the goals noted in the previous section, *Section 2.*

Appendix B and *Appendix C* include the questions noted for each variable in the following sections. *Appendix D* and *Appendix E* include the data analysis tables for the calculations and diagrams described in the following sections.

The variables are presented in two sections according to their means of data collection: Key informant interviews/visualisations/secondary sources and surveys. In each section the variables (e.g age, education, literacy, religion, ethnicity) are presented in groups because they have closely related meanings, means of data collection, analysis and/or uses. Refer to Tables 4.1 and 4.2 in section 4 for lists of all the variables.

COMMUNITY LEVEL DEMOGRAPHICS

K1. STUDY AREA

What it is

The study area refers to the location of the coastal and marine resources and the stakeholders where the study is being conducted. The boundaries of the study area are determined by the physical location of the resources and by where the stakeholders live and work. The study area will therefore often encompass a coastal area and the adjacent water catchment area. The stakeholders may be highly mobile and spread far wider than the area that is managed. There may be one or several communities in the defined study area that include all important stakeholders. See the *GCRMN Manual, Chapter 1: Preparatory Activities, Identify study area and study sites* for further discussion.

How to collect the data

Information on the study area is usually obtained from maps of the area and discussions with key informants, such as a community leader. As noted in the *Secondary Source/Interview Guide*, it is important to answer the question: What are the boundaries of the study area? The area needs to be noted on a map. Prepare a map in consultation with key informants, using native names to mark areas of geographical importance for the community. Refer to *Appendix D Key informant interviews analysis sheets*.

Additional data collection: It may also be useful to collect data on seasons and wind use patterns as perceived by the community. Refer to Appendix *D Key informant interviews analysis sheets*.

How to analyse the data
Summarise the information from the key informants and maps onto a single map, which will be used throughout the monitoring and presented along with the results. The boundaries of the study area, based on the coastal and marine resources and the location of the stakeholders, should be identified on the map. Sites of importance may also be noted. The resulting map needs to be included with the *Interview/Secondary Source Analysis Sheet.*

How the information can be useful to managers and other stakeholders
Clearly identifying the study area is important to identifying use patterns and potential threats to the resources. By noting the areas on a map, the managers can see the geographical features that are included in the area, such as watersheds, agricultural areas, high-density residential developments, reef entrances, coral patches, mangroves, lagoon etc. in coastal areas and atolls.

Mapping the area will often be an important step in building a relationship between management and communities. Visualisation tools are used to make social maps of the community and activity resource use map.

From the perspective of the socioeconomic monitoring programme, it is critical to define the study area since this is the focus of monitoring over time. In order to be able to make comparisons over time, the monitoring team must be clear on the communities within the boundaries of the study area.

K2 & K3. POPULATION, NUMBER OF HOUSEHOLDS

What it is
The population is the total number of people residing in the study area. The number of households is the number of units defined as households at the beginning of the SocMon process (e.g. people sharing food and income) in the study area, regardless of the number of families residing in the houses.

How to collect the data
Data on population and household number are usually obtained from national, regional and/or local census statistics, which may be available from local government offices or the town council. It is important to cross-check these data with key informants, such as a community leader. As noted in the *Secondary Source/Interview Guide,* the critical questions to address are:

How many people live in the study area? _____
How many households are in the study area? _____

Additional data collection: It may also be useful to ask about changes in population throughout the year and the causes of these changes.

How to analyse the data
Use the data from the secondary sources and key informants to determine the population size and number of households and note them on the *Interview/Secondary Source Analysis Sheet*.

Additional analysis: Subtract the results from previous years to calculate changes over time. Compare changes in population and households and number of households over time with changes in resource conditions and the data from *levels and types of impact (K23)* to see if population changes are correlated to conditions and impacts.

How the information can be useful to managers and other stakeholders
Understanding the study area population levels and number of households is important to understanding threats. Population levels provide a general sense of the level of pressure on the natural resources. Higher populations generally place greater pressure on resources. The information on changes over time can also be useful in determining if these pressures are increasing, decreasing or staying the same. Comparisons with resource conditions and levels of use help determine how much increases in population are influencing resource conditions.

From the perspective of the socioeconomic monitoring programme, population and number of households are important in determining the sample of households to interview. It is therefore important to collect this information from the key informant interviews before starting the surveys.

K4. MIGRATION RATE

What it is
Migration rate refers to the percentage change in population size as a result of people moving into or out of the study area in the past year.

How to collect the data
Migration data are usually available from national, regional and/or local census statistics, which may be available from the local government offices. It is important to cross-check these data with key informants, such as a community leader. As noted in the *Secondary Source/Interview Guide*, the critical question to address is:

What was the net increase or decrease in people moving into and out of the study area in the last year? _____ (note + or – to reflect moving in or out)

How to analyse the data
Use the data from the secondary sources and key informants to determine the migration rate and note on the *Interview/Secondary Source Analysis Sheet*. For example, if there were 1000 people in a community in 1999 and 500 moved into the study area by 2000, then the migration rate would be 500/1000 = 50%.

Additional analysis: Subtract the results from previous years to calculate changes over time. Compare changes in migration rates over time with changes in resource conditions and the *levels and types of impact (K23)* to see if migration rates are correlated to conditions and impacts.

How the information can be useful to managers and other stakeholders
Migration rates are also useful for understanding threats. As people move into an area, pressures on the resources increase. The comparison with resource conditions and levels of impacts is particularly useful to see if the newcomers are associated with changing conditions and impacts.

Migration rates are also important for interacting with stakeholders, particularly for developing awareness programmes. Immigrants can be expected to have less awareness of the coastal resources and management programmes than long-term residents. A coastal management programme with a high migration rate into the community may want to develop programmes tailored to this growing population with a limited base understanding and appreciation of that environment. For example, the manager may want to have community meetings with traditional resource users and immigrants to introduce the newcomers to existing tenure systems. Furthermore, if the manager knows what activities the immigrants are involved in, he or she can target those activities. For example, if there is a large number of new hotel operators coming in and clearing mangroves with little understanding of the coastal ecology, then the manager may want to develop an educational video about the importance of marine resources as tourist attractions and the impacts of hotel practices on these valuable resources.

K5-11. AGE, GENDER/SEX RATIO, EDUCATION, LITERACY, ETHNICITY/CASTE/TRIBE, RELIGION, LANGUAGE

What it is
Age, gender, education, literacy, ethnicity, and religion are basic demographic variables. Education is measured by the average number of years of formal schooling completed by study area members over 16 years old. Literacy is measured by the percentage of study area members able to read and write. Age is measured by the percent of study area members in different age categories. Gender is measured by the percentages of the population that are male and female. Ethnicity and religion are measured by the percent of study area members of various ethnic origins and religious affiliations, respectively.

How to collect the data

Basic demographic information on the study area is typically available from secondary sources, such as government census departments, town offices and community centers. It is important to cross-check these data with key informants, such as the community leaders.

The data collection should focus around determining the percent of the people in the study area that are in various categories of age, gender, education, religious affiliation and ethnic affiliation. As noted in the *Secondary Source/Interview Guide*, the key questions to address are:

What percent of the people in the study area are currently in the following age categories?: 0-18 _____;19-30 _____;31-50 _____; over 50_____

What percentage of the population is male or female?: male _____; female ___

What is the average number of years of education for people over 16 years old in the study area? _____

What percentage of the population is literate (can read and write)? _____

What is the ethnic make-up of the study area (percent of each major ethnic group in the study area? (write-in) _____; (write-in) ____; (write-in) _____

What is the religious make-up of the study area (percent of each major religious group in the study area? (write-in) _____; (write-in) ____; (write-in) _____

What are the major languages spoken in the study area (percent of each major language in the study area? (write-in) _____; (write-in) ____; (write-in) _____

Additional data collection: The team may want to get information on the political affiliations of the stakeholders, at the community level. This is highly sensitive information and may be best obtained through key informants or secondary information. Political affiliation can prevent people from working together. Political affiliation can also provide insight into people's perceptions and values of the resources.

It also may be appropriate in some areas to collect information about clanship. This could be of importance where responsibilities and roles are dictated by clans. This information could also be cross checked with results of *informal tenure and customs* (K33) and *power and influence* (K37).

How to analyse the data

From the secondary sources and key informants information determine the percentage of people in each of the categories and note in the *Interview/Secondary Source Analysis Sheet*. An example for age follows:

Percent of community age: 0-18__23%_; 19-30 _41%_; 31-50 _16%_; over 50_20%_

Additional analysis: Three pie charts may be prepared to visually illustrate the age and religious and ethnic distribution in the study area. Subtract the results from previous years to calculate changes over time. In addition, it may be useful to describe the demographic make-up of the study area and how it has changed over time.

Similar data are collected as part of the surveys. Comparison between results allows for a check on the accuracy of the data. If there are differences between results, then it may be useful to consult with the key informants to identify the cause of the discrepancy. Otherwise a full census survey (surveys of all households, not just a sample) should be conducted to accurately understand the study area demographics.

How the information can be useful to managers and other stakeholders

All of these variables are important for developing stakeholder participation in management. Education, literacy and age can be predictors of receptivity to new ideas. Generally, as age increases, openness to new ideas (e.g. establishment of a no-take area) decreases. And as education levels increase, open-mindedness increases. For example, an educated young fisher may be more willing than a non educated fisher to go through extensive training for a new career. By understanding these variables, managers gain a sense of likelihood of awareness, support and compliance with management measures.

Ethnicity and religion are important aspects of social structure and frequently related to group membership, loyalty and other aspects of social behaviour. Similarity often leads to a greater willingness to work together. By understanding ethnic and religious affiliation, managers can better understand how the stakeholders behave and therefore how to interact with them. A relatively homogenous, or similar, community will likely be more capable of working together than an area with divergent ethnic and religious interests.

This information can also be useful in determining entry points to groups. For example, if religious affiliation is strong, then the religious services or meetings may be a means of reaching people and religious leaders may be appropriate representatives of the community members. Ethnicity and religion can also provide insight into people's perceptions and values of the resources, although this requires an understanding of their religious, ethnic beliefs.

Depending on the culture, gender can also be a strong indicator of participation since in some cultures women are not actively engaged in politics and management. It may be more difficult in these cases to actively involve them in management.

Education, literacy, and religious and ethnic affiliations are important to understanding impacts of management on livelihood and well being over time. Increases in education levels associated with a particular management strategy indicate a positive impact. Severe reductions in the population percent of particular ethnic groups may indicate that a management strategy is having an inequitable impact on that group. The difficulty in these interpretations is making the correlation to management strategies amidst all the other policies and programmes that may be causing these changes.

Age is useful for predicting future pressures on the resources. A very young population, which is common in many South Asian nations, indicates there will be more pressure on the resources in the coming years.

Also, from the perspective of the socioeconomic monitoring programme, the information on distribution of age, gender, education, ethnicity, religion and occupational structure will be useful for ensuring the breadth of people in the study area are interviewed. For example, if there are 30% boat owners, 60% net fishers and 10% non native fishers, then the team needs to ensure interviews are conducted with approximately the same percent from each group. It is important to collect this information from the key informant interviews before starting the surveys. See *Section 3.4* for a discussion on selecting respondents..

K 12. OCCUPATION

What it is

Occupation refers to an activity that provides livelihood, such as income, food or other means of sustenance. The primary occupation is the main source of livelihood, whereas the secondary and tertiary occupations are the second and third most important sources of livelihood.

How to collect the data

Data on occupation may be available through secondary sources, such as census statistics, fisheries records and community development plans. However, it may not be presented to the level of occupation that is useful to the manager. For example, "tourism" may be noted as an occupation; yet, the manager may want to know the percent of watersports operators and hotel workers separately. It is therefore important to interview key informants, such as the community leaders and representatives of various sectors (e.g. fisheries associations, hotel associations). The information needs to be included in the *Secondary Source/ Interview Guide* table as illustrated below.

Additional data collection: The team may ask about the existence of illegal occupations, such as poaching. Since this information is difficult to obtain from the survey respondents, it is especially important to collect from key informants. Observation can also provide information on illegal activities in the study area.

The team may also want to ask about levels of unemployment or underemployment - high levels may indicate greater pressure on the resources.

How to analyse the data

Using the data from the secondary sources and key informants, determine the percentage of the working population in each of the categories and the number of people primarily engaged in each occupation as their primary occupation. Note this information on the *Interview/Secondary Source Analysis Sheet* as in the following example.

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	58%	580	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%
6. Govt jobs	3%	30	0%	0%

Additional analysis: Subtract the results from previous years to calculate changes over time. Compare these results with changes in resource conditions, *types of use (K16), levels and types of impact (K22)* and *perceived threats (S17)* to see if there is a correlation. It may also be useful to give a short description of the major occupations, their importance given the percent and number of people engaged in each of them, and how this has changed over time.

The percentages of primary and secondary occupations may be combined as an indication of dependence on each occupation. In this example 80% of the working population is dependent on fishing while another 10% consider it a tertiary occupation.

Similar data are collected as part of the surveys. Comparison between results allows for a check on the accuracy of the data. If there is a large difference between results, then a full census survey may be necessary. Note that the survey data are based on the entire population (not just the *working population)*, which includes those unemployed. To accurately compare, the survey percentages will need to be recalculated based only on the people listed as working (i.e. not the people who noted "student", "unemployed", etc., as their occupation).

How the information can be useful to managers and to other stakeholders

Occupational structure is one of the most useful sources of information regarding threats. It provides an understanding of the number of people engaged in coastal activities, many of which are potential threats to the resources. The changes over time and comparisons with levels and types of impact (K23) and resource conditions can be particularly insightful regarding threats. For example, if more and more people are seen to be shifting into fishing as their primary occupation over time, then over-fishing may be a growing concern. Comparisons with resource conditions should indicate a decline in number of fish as the number of people fishing increases. Comparisons with types of use (K16) and levels and types of impact (K23) can also be useful in seeing how those activities are likely to be increasing. Comparison with perceived threats (S17) is useful for seeing how the community perceives these increases – whether they are seen as impacting the resources. If the number of fishers is increasing, but resource conditions are good, the types of uses are relatively benign, and the community does not consider fishing a medium or high level of impact, then fishing may not be a threat.

Occupational structure is also useful for determining the importance of marine resources. The greater the percentage of people using the resources, the greater the dependency, and therefore the more important the resources. Increases in number and/or percent of people working in coastal-related activities over time indicate the importance is also increasing. The distribution of people in various occupations also indicates the level of community economic stability, which is also important for understanding the importance of the resources and community resilience. If the majority of people depend on fishing, then the community will be severely impacted by a collapse in the fishing industry. Many households in South Asia are multi-occupational, which is a practical economic strategy to ensure adequate and regular income for the household and increase resilience.

Finally, occupational structure is also important for determining the effects of management strategies on community livelihoods. For example, managers can see whether occupations shift after alternative livelihood training is conducted, or they can see if the establishment of a no-fishing area coincides with a shift out of fishing and into other occupations.

This information will be useful for stakeholders to understand better their level of dependence on the marine and coastal resources. Knowing the importance of different activities will help the community contribute more effectively and representatively to management and ensure that decisions take into consideration impacts on resource users and are better tailored to stakeholders' situation.

COMMUNITY INFRASTRUCTURE, BUSINESS DEVELOPMENT AND OWNERSHIP

K13. COMMUNITY INFRASTRUCTURE, BUSINESS DEVELOPMENT AND OWNERSHIP

What it is

Community infrastructure is a general measure of the local community development and wealth. It is a description of the level of community services (e.g. hospital, schools, telephone, fax internet, broadband, Electricity, marketing, credit, hotels, water supply, transport air, ship, bus or train, PDS, Cold store, SHG) and infrastructure (e.g. roads, utilities), which can include information essential to determining sources of man-made impacts on coastal resources (e.g. sewage treatment).

Business development is a general measure of local community and economic development and opportunities are based on credit and communications infrastructure available. It is based on the number and type of commercial businesses in the area and who owns them (whether the owners are from within the community - "native" or outsiders). Business ownership will give an idea of whether income from these businesses is likely to be spent in the area, and thus have a large or medium impact on the development of the local area. Business expansion and development will also depend on informal and informal credit availability and good communication and transport infrastructure.

How to collect the data

This information is collected by interviewing key informants, community leaders or town engineers; reviewing secondary data from town records, particularly the community development office; and walking through the community, observing and inventorying community infrastructure.

For community infrastructure it is important to determine whether the following items exist in the study area:

schools, resident doctors, resident nurses, hospitals, functioning dispensaries, electricity, telephone, internet access, radios, televisions, newspapers, sewage treatment plant, ice plant, tarmac road access, water supply to homes, banking services, informal credit, religious buildings, restaurants, transport, frequency of ship, air, bus and train availability and schedules.

For business development it is important to determine whether the following items exist in the study area:
food markets, restaurants, food stalls, gas stations, banks, pawn shops, specialty shops, gift shops, dive shops, tour operations, fishing guides, guesthouses/hotels/ inns/resorts, yacht charters.

For each of the items listed it will be important to understand who owns the businesses (i.e. owner's place of residence and their origin). The different categories of owners will be ranked according to their importance in numbers as shown in the table below. Residence and origin categories will have to be clearly defined.

Business	Credit source & interest rate	Rank*	Owner's origin and place of residence	Rank*
Rank in order of frequency: the least numerous category will be ranked 1.				

In some cases these lists may need to be modified to more accurately reflect variables of community infrastructure and business development within the study area. It is important to include the range of infrastructure in the region. For example, if televisions are already prevalent in the region, but satellite receivers are only beginning to appear, then it may be more appropriate to include satellite receivers in the list. Accurate scale construction is needed to make meaningful comparisons between communities and over time, such as pre- and post-marine or coastal protected area establishment.

Similarly it is important to establish a list of formal and informal sources of credit in the study area: banks, micro credit schemes, cooperatives, revolving funds, money lenders. For each of these items the respondents are asked about the interest rates, limiting conditions to access credit (e.g. employment conditions, gender limitations, residency etc.) and the team should note whether the source of credit is formal or informal.

Additional data collection: The team may also collect more specific information on the number and characteristics of these items.

More specific information could also be collected on the quality of human health. This is a measure of the general nutrition and health of people in the community and the quality of life and relative wealth in the community. If coastal management is providing improvements in livelihood and income, and overall improvements in wealth in the community, then it could be expected that the quality of human health could increase. A variety of measures of quality of human health can be used these include infant mortality and maternal mortality rates, availability of health services, and variety and rate of diseases, such as HIV/AIDS.

How to analyse the data

List the infrastructure items obtained from observations, key informant interviews and secondary sources in the *Interview/ Secondary Source Analysis Sheet*.

An example of results on business ownership is provided below.

Business	Credit	Rank	Origin and place of residence of owners	Rank
Fishing guides	Self/family Bank	1 2	Native, residents Non-native, residents	1 2
Fish traders	Money lender bank	1 2	Native residents Non-native non-residents	1 2
Tour operators	Self Bank	1 2	Overseas, foreigners National non-resident, non-local Foreigners, residents	1 2 3

Additional analysis: Compare these lists over time. A short description based on this list may be prepared describing the infrastructure in the study area and how it has changed over time. Compare the types of owners and see how the ranking evolves over time and other categories of owners emerge.

How the information can be useful to managers and other stakeholders

Community infrastructure and business development are useful for determining the wealth in the study area, and for determining overall impacts of management on communities in the study area. By monitoring the existence of the listed items, the manager can see if community wealth and well being are increasing, decreasing or staying the same. For example, an increase in

commercial businesses, such as dive shops, hotels and restaurants for tourists, indicates an increase in overall community economic development. The difficulty is tying these changes to coastal management initiatives. In some cases these are closely linked; for example, if a management programme has provided water access or sewage treatment to a community. In other areas coastal managers have no responsibility for infrastructure in the community.

The information on the availability of banking services, ice for fishers and hard top roads, can be useful for identifying the ability of fishers to build their businesses. At the same time, information on sewage treatment provides insight as to whether raw sewage may be affecting coastal water quality. Information on guesthouses/hotels/inns and restaurants is useful for determining the general level of tourism in the area.

Sources and availability of credit is a general measure of access to credit by the stakeholders, and opportunities for stakeholders to develop and expand their businesses. It is a list of the sources of credit whether formal or informal (e.g. banks, revolving funds, cooperatives), conditions to access credit and the amount of credit distributed in a year by these sources of credit.

Understanding the diversity of business owners will enable managers to tailor awareness and activity programmes to the different types of owners and involve them more effectively in coastal and marine management activities. Origin of owners will indicate whether the economic benefits from businesses are in fact remaining within the community, or whether profits are sent elsewhere.

Finally, the information on the existence of telephones, internet access, radios, televisions and newspapers is useful for developing education and outreach programmes in the community. Awareness campaigns can be tailored to the most prevalent medium.

COASTAL AND MARINE ACTIVITIES

K14. ACTIVITIES

What it is

'Coastal and marine activities' refer to the uses of coastal and marine resources in the study area. These are activities directly or indirectly using or affecting the coastal and marine resources. These may include, for example: fishing (subsistence, commercial, trawlers, recreational), reef gleaning, octopus hunting, fish trading, tourism, watersports (scuba diving, snorkelling, swimming, jetboats), aquaculture, marine transportation, agriculture, coral mining, sand mining, dredging, oil-gas development, military bases, mangrove clearing, forest clearing, industry and conservation.

Coastal and marine activities
Fisheries
Tourism
Aqua-culture

How to collect the data

Data on coastal and marine activities is obtained by interviewing local key informants, such as the village leaders, businessmen, fishers, fish traders and tour guides to identify the coastal and marine activities in the area. Observation is also used to identify the use activities in the area. A list is compiled of coastal and marine activities and noted in the *Secondary Source/Interview Guide* as illustrated.

Since some coastal and marine activities may be seasonal, take place at odd hours or take place out of sight of land, it is important to use a multi-method approach including observation at various times and to interview a range of key informants to ensure that the range of coastal and marine activities are identified.

Additional data collection: The coastal and marine activities can be identified on the study area map. For example, hotel areas can be identified in one colour and diving areas in another colour. The data can be placed on the map in a general or a very specific manner. It is also useful to note the seasonality of the activities as certain activities, such as fishing and tourism, may change throughout the year.

The team may also ask about the existence of illegal activities, such as fish poaching. Since this information is difficult to obtain from the survey respondents, it is especially important to collect from key informants. Observation can also provide information on illegal activities in the study area.

How to analyse the data
Note the data from the various key informants and observations and complete the table in the *Interview/Secondary Source Analysis Sheet* as shown.

Additional analysis: A short narrative may be prepared describing each of the listed activities.

How the information can be useful to managers
The identification of coastal and marine activities will provide the manager with an understanding of the various uses of coastal and marine resources and the potential for conflict in the area. For example untreated sewage being pumped into the sea can potentially conflict with the tourism sector. Aquaculture locations can conflict with access to the beach for subsistence fishers. Improved understanding of the marine and coastal uses will enable communities to contribute more effectively to management decisions, particularly when user based conflicts arise.

K15. GOODS AND SERVICES

What it is
Coastal and marine goods and services are the specific products produced from the identified coastal and marine activities. These include extractive goods such as lobster, mangrove wood, coral products and sand; and non-extractive services such as diving, snorkelling, glass bottom tours, mangrove tours and recreational fishing.

How to collect the data
Data on coastal and marine goods and services is obtained by interviewing key informants from the relevant activities (e.g. long-time fishers, president of the hotel association, long-time dive boat operators, tour leaders) as well as other key informants knowledgeable about the activities (e.g. government officials). It is also important to observe coastal activities and their physical evidence for further information and as a check on the information obtained from the interviews.

For each coastal and marine activity, the key informant is asked to identify the coastal and marine goods and services produced. For example, for tourism these might include hotels and diving. A list of goods and services is compiled for each activity and noted in the *Secondary Source/Interview Guide* as illustrated.

Since some coastal and marine goods and services may be seasonal, take place at odd hours or take place out of sight of land, it is important to use a multi-method approach, including observation at various times and interviewing a range of key informants to ensure that all of the coastal and marine goods and services are identified.

Coastal and marine activities	Coastal and marine goods and services
Fisheries	Lobster
	Grouper
	Snapper
	Octopus
Tourism	Hotel
	Diving
Aqua-culture	Oyster
	Seaweed

How to analyse the data
Summarise the information from the various key informants and observations into one table in the *Interview/Secondary Source Analysis Sheet* as shown.

Additional analysis: In addition it may be useful, on the basis of the above table, to provide a short description of the coastal and marine goods and services produced in the study area and relate it to people's perceptions of the status of these goods and services.

How the information can be useful to managers and other stakeholders
Information on household coastal and marine goods and services is useful for determining the overall impacts of management, particularly marketing and production on households in the study area. As a result of management measures, there may be a shift in the coastal and marine goods and services produced in the area, with positive and negative impacts on the household. For example, if a marine protected area actively promotes tourism in the area, then it would be expected that the value of diving would increase and more household members would shift to diving operations.

K16. TYPES OF USE

What it is

Types of use refer to the specific methods or types of activity (e.g. guest houses, snorkelling, SCUBA diving) or type of gears being employed (e.g. traps, nets, boats, lines), for each coastal and marine good and service.

How to collect the data

Data on methods are obtained by interviewing key informants who are representatives of the various stakeholder groups (e.g. president of the fishers's association, manager of the oldest sand mining operation). In addition, it is important to cross-check this information by observation–walking around the community, particularly where the various activities take place.

The key question to address is what method is used for each good and service. For example, for fish goods (e.g. grouper, lobster), the responses may include traps, nets, line, spearfishing or gleaning. For hotel services under tourism activities, the responses may range from guests houses (1-7 rooms) to inns (5-50 rooms) to hotels/resorts (>50 rooms). For aquaculture, the responses may include pond, line or cage. For fish trading, responses can include selling fish door to door by foot or bicycle, or selling fish nationally with refrigerated truck. For marine transportation, responses may include port development, shipping and recreational boating. These are only examples. The team will need to develop categories of potential responses according to its area. For example, if there are only large hotels, then the team may decide to categorise responses for hotels according to whether they are all-inclusive. The resulting information is noted in the *Secondary Source/Interview Guide* table as illustrated.

Coastal and marine activities	**Coastal and marine goods and services**	**Methods (primary)**
Fisheries	Lobster	Trap
	Grouper	Handline
Tourism	Hotel	Guest houses (1-7 rooms)
	Diving	SCUBA
Aquaculture	Oyster	Line

Additional data collection: For each of these types of uses, the team may want to ask about the level of use, such as the number of traps and handlines. These numbers could then be compared over time to see if levels have increased, decreased or stayed the same.

For the fisheries data, the team may want to add another column to further identify the type of fisheries based on the following categories:

Large-scale – powered, high-investment, machine-made equipment, electronics, division of hired labor, products found worldwide, operating in distant waters.

Industrial – powered, high-investment, machine-made equipment, electronics, division of hired labor, products found worldwide, operating in national exclusive economic zone.

Small-scale – small boat, small engine, partly or wholly machine made equipment that is operator assembled, full- or part-time labor, mechanised and manual gear, national and local markets, operating in nearshore coastal waters.

Artisanal - small boat, small engine, partly or wholly machine made equipment which is operator assembled, full- or part-time labor, mechanised and manual gear, local markets, operating in near shore coastal waters.

Subsistence – lone operators, family or community group, part-time labor, small boat, un-powered, non-mechanised, operator-assembled fishing gear, primarily for home consumption, operating in coastal waters.

How to analyse the data

Summarise the data from the interviews and observations to compile a list of methods used in the study area. Note this information in the *Interview/Secondary Source Analysis Sheet* as shown.

Additional analysis: Compare the results over time to determine shifts in methods. Compare changes in types of uses with changes in resource conditions and the *levels and types of impact (K23)* to see if the methods are correlated to conditions and impacts.

How the information can be useful to managers and other stakeholders

Information on the methods is particularly useful for identifying threats, such as mangrove clearing, to coastal and marine resources. By monitoring this information over time, the manager can also see what impact management has had on these methods. For example, if the coastal management programme initiated a mangrove replanting campaign, yet mangrove clearing continues to be listed as a method, then this indicates that the campaign is not preventing continued mangrove clearing. This information also helps to determine the effectiveness of coastal management programmes.

Understanding what methods are taking place in the study area is also critical to developing stakeholder participation and awareness programmes in coastal management. The managers need to know how people are tied to the resources in order to work with them and communicate with them regarding threats to the resources.

This information will also enable stakeholders to have a better picture of the importance of different methods used in the study area. This may help resolve user based conflicts, by understanding the scale of issues for example caused by specific fishing gear, conflicts may be resolved by the stakeholders themselves or suggest to the managers solutions on how to deal with some of the conflict areas.

K17. VALUE OF GOODS AND SERVICES

What it is

The value of coastal and marine goods and services is the relative and/or the actual monetary value for each product in the market.

How to collect the data

Data on the value of coastal and marine goods and services is obtained by interviewing local key informants such as fishers, buyers, traders, hotel operators, and dive operators. They are asked to put a value (high, medium, or low) on the product of each coastal and marine good and service. High, medium, and low will need to be specifically defined in advance by the team for the study area to ensure consistency in responses. For example, a value of high may be placed on lobster if it has high demand and high monetary value in both the local and international markets. A value of medium may be placed on hotel development if it is composed of only a few guesthouses. A value of low may be placed on a cleared mangrove area that does not support much bird life and therefore has low potential for ecotourism. The information is noted in the *Secondary Source/Interview Guide table* as illustrated.

Coastal and marine activities	Coastal and marine goods and services	Value of soods and services
Fisheries	Lobster	High
	Grouper	High
Tourism	Hotel	Medium
	Diving	Low
Aqua-culture	Oyster	Medium

Additional data collection: The team may want to ask the prices for key goods and services. The seasonal change in prices has to be considered. Thus it may be appropriate to note an average price for each season for key products identified by the team. The results will be added in *Secondary Source/Interview Guide table*.

How to analyse the data

Summarise the data from the various key informants into the table in the *Informant Interview/Secondary Source Analysis Sheet* as shown. The definitions of high, medium, and low should be noted.

Additional analysis: It may be useful to provide a description of the value of the coastal and marine goods and services.

How the information can be useful to managers and other stakeholders

The value of coastal and marine goods and services is useful for determining the overall impacts of management on communities in the study area, including livelihood, marketing, production and food security. For example, if the management authority begins promoting products from an aquaculture cooperative the authority initiated, then it would be expected that the value of these products would increase as demand increased.

The value of coastal and marine goods and services is also useful in demonstrating the importance of managing the area for sustainable use. For example, if SCUBA diving brings in a large number of international visitors with a high value due to demand for rooms, restaurants and dive operators, the coastal manager has justification for putting management efforts into ensuring the sustainability of coral reefs and fisheries in the study area. In contrast, if the coral reefs have been fished with dynamite and have a low value for diving, the manager may have a more difficult time justifying the importance of the reefs for diving.

The value of coastal and marine goods and services is also useful in determining which resources are under greatest harvesting pressure and may therefore need particular attention by managers. The value is a measure of the product's relative importance. Since prices influence human behaviour, harvesting pressure is likely to be strongest on the most valuable products. A higher value fish, for example, will demand greater attention and fishing effort than a lower value fish and therefore may require particular attention from the coastal manager.

The value of coastal and marine goods and services is also useful in understanding the level of household income and the well being of the household. If, for example, product values shift from high to low, then a decline in income and well being would be expected.

K18. TARGET MARKETS OF GOODS AND SERVICES

What it is
Target markets of goods and services is the identification of the market in which each product is primarily sold.

How to collect the data
Data on coastal and marine goods and services target markets are obtained by interviewing local key informants such as fishers, buyers, hotel operators and dive operators. These key informants can provide information on the primary market for each coastal and marine good and service.

The key informants are asked to identify the primary market in which each good or service is sold (local, regional, national or international). The resulting information is noted in *Secondary Source/Interview Guide* table as illustrated.

Coastal and marine activities	Coastal and marine goods and services	Goods and services target markets (primary)
Fisheries	Lobster	International
	Grouper	Regional
Tourism	Hotel	International
	Diving	International
Aqua-culture	Oyster	Local

Additional data collection: Alternatively, the key informant is asked to list all markets for each good or service and to rank them in order of importance of each market. This is useful for understanding the full range of markets. In addition, the team may want to ask information about marketing mechanisms (e.g. is fish sold in auctions, fixed price by cooperative etc.) for the different goods and services produced.

How to analyse the data
Summarise the data from the various key informants into the table in the *Interview/Secondary Source Analysis Sheet* as shown.

Additional analysis: It may be useful to describe, on the basis of the table above, the market for each of the goods or services. A flowchart may show better the flow of each good or service from source to market.

How the information can be useful to managers and other stakeholders
Target markets information is useful for determining the overall impacts of management on communities, particularly marketing, production and food security. For example, investments in community infrastructure, such as roads to major cities, can result in greater access to national, regional and international markets.

Since the livelihood and income of people in the community are linked to markets, the fish market orientation is important as it provides for an understanding of where aquatic products produced in the area are sold. This variable allows for an analysis of changes over time in the markets for major aquatic products. It shows the relationship of local producers and traders with various markets, for example, linkages with international markets, which may affect harvesting practices.

Target markets information can also be useful as an indication of how much pressure may be put on the resource. For example, fishers may put intense fishing effort on a high valued fish for international markets. It can also give an indication over time of shifts in markets for aquatic products. The impact of management measures can be assessed through changes in markets. For example, management measures may result in higher value fish being available in the area that may be marketed in regional or national markets.

Understanding better their links with the different markets will provide the stakeholders with a better knowledge of the change in opportunities for business.

K19-22. TRADITIONAL KNOWLEDGE, USE PATTERNS, ACTIVITY LOCATION, SEASONALITY

What it is

Traditional knowledge refers to the traditional ecological knowledge possessed by the community and use patterns refer to location, seasonality and timing of coastal and marine activities.

How to collect the data

Coastal and marine activities	Coastal and marine goods and services	Methods (primary)	Location	Timing	Season
Fisheries	Lobster	Trap	Bays	Low tide	All
	Grouper	Handline	Reefs	Low tide	Season 1
	Octopus	Spears	Reefs	Low spring tides	All
Tourism	Hotel	Guest houses (1-7 rooms)	Coast		Season 2
	Diving	SCUBA	Reefs	Low tide	Season 2
Aquaculture	Oyster	Line	Bay		

Data on use patterns are collected first from secondary sources, including community and town offices, which may have maps noting the location of various activities in the area (e.g. a zoning map that notes farming areas, a fisheries study that documents fishing areas). Next, key informant interviews are conducted with representatives of the various activities (e.g. expert fishermen, gleaners, octopus hunters, dive centre, resort owner). Participatory mapping techniques could also be used (*see GCRMN Manual, Chapter 3: Field Data Collection, Visualisation Techniques, Maps*). Finally observations are used to identify and verify use patterns.

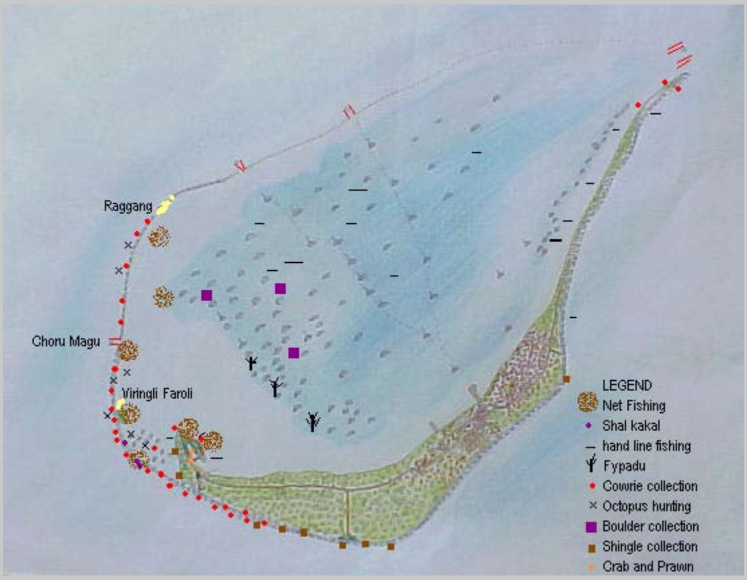
Additional data collection: The team can use participatory tools to record the locations of the various activities on the base map, using the place names in vernacular. This will provide much more information on locations than simply noting bays or reefs. The team might also ask about changes in use patterns throughout the year and the causes of these changes.

Information is collected on the location and timing/season of each activity according to the good or service and noted in the *Secondary Source/Interview Guide* table as illustrated. A seasonal calendar can be prepared while conducting the interview this will help both the key informant in having the same understanding. Figures 1 and 2 show a resource activity map and seasonal diagram prepared with the help of traditional resource users of Minicoy Island, India.

How to analyse the data

Determine the locations of the activities which you obtained from the key informant and secondary sources. , Record them in the *Interview/Secondary Source Analysis Sheet* as shown. Draw an activity resource map and seasonal calendar to clearly show the resource use patterns of the resource users in the coastal community. Examples of a resource activity map and seasonal diagram prepared in consultation with resource users of Minicoy Island, India are given in Boxes 1 and 2 below.

Box 1. Resource activity map for Minicoy Island.



Box 2. Seasonal calendar for reef related activities in Minicoy Island

Weather condition>	**Stormy**		**Wet**			**Calm Season**					**Hot**	
Activity	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Cowry collection					♀♀♂♀♂♀♂♀♂♀♂♀♂♂♀♀♂♀♀♂♀♂♀♂♀♀♂♀♀♂♀♀♂♀							
Boulder collection					♂ ♂							
Shingle & Sand					♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂							
Octopus hunting	♂♂	♂ ♂ ♂ ♂ ♂			♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂♂ ♂ ♂ ♂♂♂♂♂♂							
Cast Netting	♂♂♂♂♂♂♂♂♂♂♂♂♂ ♂♂♂♂ ♂					♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂					♂	
Netting(Shal kakal)	♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂						♂ ♂ ♂ ♂		♂ ♂ ♂ ♂ ♂ ♂			
Shore Hand line	♂ ♂ ♂ ♂ ♂ ♂		♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂									
Boat hand line	♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂								♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂			
Crab and Prawn	♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂ ♂								♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂			
Pole & line Tuna					♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂♂							
Snorkelling					♀ ♂ ♀ ♂♀ ♂ ♀ ♂ ♀ ♂♀ ♂ ♀ ♂ ♀ ♂ ♀ ♂ ♀ ♂							
Source: Focus group discussion with stakeholders December 2002 & May 2003												

Additional data analysis: By comparing the locations of the various activities, the team can identify areas of overlap and therefore potential conflict. Compare the locations over time to see how use patterns are shifting. A brief narrative may be prepared describing the activities, their location and how they have changed over time.

How the information can be useful to managers and other stakeholders

Similar to *types of use (K16)*, information on use patterns is useful for identifying threats to the coastal and marine resources. By understanding the locations of activities, the manager can better determine the impact. For example, if hotel development is

occurring near a coral reef, there is potential for impacts from sediment run-off and sewage release. The size of the area also is an indicator of the level of impact. This is particularly useful since the information from *types of use (K16)* provides an understanding of the activities taking place, but not how much.

By monitoring this information over time, the manager can also see the impact management has had on these activities. For example, if the coastal management programme initiated a mangrove replanting campaign and mangrove clearing continues to be listed as an activity, the manager can look at the size of the area being cleared and see if it has increased, decreased or stayed the same from previous years. If it has declined, then the programme may have had some positive effect. This information also helps to determine the effectiveness of coastal management programmes.

Finally, by mapping the use patterns, managers can better understand problems, particularly conflicts over access to resources and overlapping uses among stakeholder groups. This can help determine if measures, such as zoning of activities, are appropriate for an area.

By understanding better use patterns and the characteristics of the areas where they operate, stakeholders will be able to understand better the impact they may have on the coastal environment and the consequences for their business in the future. Stakeholders can then contribute more effectively to management decision on protecting sensitive areas.

K23. LEVELS AND TYPES OF IMPACT

What it is

Levels and types of impacts are measures of the perceptions of the general public and types of impact of coastal and marine activities on coastal and marine resources. This is not a scientific assessment of levels and types of impacts, but rather a documentation of what people think.

Coastal and marine activities	Coastal and marine goods and services	Methods (primary)	Level of Impact	Types of Impact (primary)
Fisheries	Lobster	Trap	L	Overfishing
	Grouper	Handline	M	Overfishing
Tourism	Hotel	Guest houses (1-7 rooms)	M	Pollution
	Diving	Scuba	L	Anchor damage
Aquaculture	Oyster	Line	L	Nutrient loading

How to collect the data

The data are collected by interviewing key informants or focus groups, including community leaders and officials, longstanding members in the community and others who represent the general views of the community.

The key informants are asked to identify, using a scale of high/ medium/ low/ none, the level of impact of each coastal and marine activity according to its goods and services. While they will need to be adapted for each study area, high could mean severe and irreversible impacts on the resources, such as cutting and filling mangrove areas; medium could mean moderate impacts on the resources, such as cutting mangrove areas; low could mean minor impacts on the resources, such as a small percentage of mangrove area being disturbed; and none could mean no impact. The levels of impact (High, Medium, and Low) will need to be specifically defined in advance by the team for the study area to ensure consistency in responses.

The primary types of impacts are then briefly noted. For example, if hotel development is causing pollution, then pollution would be noted. The resulting information is noted in the *Secondary Source/Interview Guide* table as illustrated.

Additional data collection: The types of impacts can be described in greater detail to identify direct and indirect impacts. For example, sewage outflow is a direct impact on water quality, and up-stream agriculture causes sedimentation during the rainy season.

How to analyse data

The data are summarised to determine the general level of impacts and types of impacts and entered into the table in the *Interview/Secondary Source Analysis Sheet* as shown. The definitions of level of impact (High, Medium, and Low) should be noted.

Additional analysis: The results are compared with results from previous years to identify shifts in types and levels of impacts. The changes are compared with resource conditions to determine if there is a correlation.

Similar data are collected as part of the surveys where people are asked what they think are the top five major threats to coastal resources. Comparison between results allows for a check on the accuracy of the data. The activities identified by the individuals should be noted as high in the table completed by the key informants. If there is a large difference between results, then the key informants should be consulted to clarify. A full census survey may be necessary to accurately determine perceptions.

How the information can be useful to managers and other stakeholders

Similar to *types of use (K16)* and *use patterns (K20)*, information on levels and types of impacts is useful for identifying threats to the coastal resources. Community members, particularly people who directly use the resources, are often the most knowledgeable about what is affecting the resources they use on a regular basis. This information can be critical for identifying activities in need of scientific study. For example, community members may note oil and gas development as high impact because they have seen a few substantial spills. This impact may be missed by scientific studies only conducted once a year.

By monitoring this information over time, the manager can also see the impact management has had on these activities and therefore how effective management has been. For example, if the coastal management programme initiated a programme to reduce the use of pesticides and other chemicals in upland agricultural areas, yet this continues to be identified as a type of impact, then this suggests that the programme may not have been effective.

Finally, this information is critical for developing awareness programmes and seeking stakeholder participation. If community members do not consider there to be impacts on the coastal resources, then it will be difficult to engage them in coastal management. If community members consider only one or two activities to be impacting the resources, yet scientific research shows there are several other impacts, then an awareness programme may need to be initiated to increase understanding of the full breadth of activities impacting the resources.

K24. LEVEL OF USE BY OUTSIDERS

What it is

Level of use by outsiders refers to the amount of outsiders using the coastal resources relative to the amount of local users from the study area. For example, if there are 1000 foreign fishers and only 10 local fishers, then the level of use by outsiders is high. Outsiders are people who do not live in the study area (or live in the area on a seasonal basis). They may be from a neighboring community or another country.

How to collect the data

This information is obtained by conducting interviews with key informants, such as community leaders and town officials, as well as representatives from the various stakeholder groups.

Coastal and marine activities	Coastal and marine goods and services	Methods (primary)	Level of use by outsiders
Fisheries	Lobster	Trap	L
	Grouper	Handline	L
Tourism	Hotel	Guest houses (1-7 rooms)	H
	Diving	SCUBA	H
Aquaculture	Oyster	Line	M

The key informants are asked what the current level of use by outsiders for each coastal and marine activity is using a scale of high, medium and low. The scale will need to be defined for each study area, but high could mean a great deal of use by outsiders, such as the majority of fishing in the study area is conducted by outsiders; medium could mean moderate use by outsiders, such as a few international tourists, and low could mean minor use by outsiders, such as one guest house out of twenty in the study

area is owned by a foreigner. The level of use (high, medium, and low) will need to be specifically defined in advance by the team for the study area to ensure consistency in responses. The responses are noted in *the Secondary Source/Interview Guide* table as illustrated. See also *community infrastructure, business development and ownership (K13).*

Additional data collection: The key informants may be asked to identify from where the outsiders originate.

How to analyse the data
Synthesise the data from the key informants to determine the level of use by outsiders for each activity and enter into the table in the *Interview/Secondary Source Analysis Sheet* as shown. The definitions of high, medium, and low should be noted.

Additional data analysis: Compare these levels over time. It may be useful to provide an explanation on the extent of use by outsiders and how that has changed over time.

How the information can be useful to managers and other stakeholders
Information on levels of use by outsiders is useful for developing stakeholder participation and awareness programmes. Non-residents are often overlooked because they are not immediately visible. By understanding the relative numbers of people coming from other areas, managers can determine the importance of building relationships with people from outside the community. If the manager knows where the outsiders are coming from, he/she can target those areas. In cases where there are users coming from overseas (e.g. foreign fishing vessels), the manager may decide to work through customs and immigration offices. In other cases it may be a matter of expanding education and outreach programmes to neighboring communities.

Outside use is also important to understand coastal management problems. For example, increasing numbers of foreigners can often be a source of conflict in a community.

This information can also be useful for determining the value and importance of the resources. If people outside the study area are using the resources, then this shows that the resources are important to a larger area than just the immediate community. This can be important for informing politicians and the public about the need for additional resources for coastal management.

K25. HOUSEHOLD USE

What it is
The use of coastal and marine goods and services is a measure of how households in the study area utilise coastal and marine goods and services for consumption, leisure and sale. This variable is most relevant to extractive activities (e.g. fishing, aquaculture).

Coastal and marine activities	Coastal and marine goods and services	Household use (primary)
Fisheries	Lobster	Sale
	Grouper	Own
Tourism	Hotel	Sale
	Diving	Sale
Aquaculture	Oyster	Sale

How to collect the data
Data on household use of coastal and marine goods and services is obtained by interviewing key informants, such as community officials and business people. The key informants are asked to identify and rank the general household use of each good or service. They are asked if resources are used for personal consumption, leisure or sale. Personal, or 'own consumption', means use in the household, such as fish for food; leisure means for recreation; and sale means selling to obtain money or to barter for other goods. The responses are recorded in the *Secondary Source/Interview Guide* table as illustrated.

Additional data collection: If food security is a concern, then the key informants may be asked questions relating to food security issues such as whether there are a variety of reasonably priced food products available throughout the year and whether the locally caught seafood products are regularly available at a reasonable price.

How to analyse the data
Summarise the data from the various key informants into the table in the *Interview/Secondary Source Analysis Sheet* as shown.

Additional analysis: Similar data are collected as part of the surveys. Comparison between results allows for a check on the accuracy of the data. If there are differences between results, then it may be useful to consult with the key informants to identify the cause of the discrepancy. Otherwise a full census survey (interviews of all households, not just a sample) should be conducted to accurately understand the study area demographics.

How the information can be useful to managers and other stakeholders

Information on how households use coastal and marine goods and services provides insight into household dependence on resources for food and income. It is therefore important for understanding issues of food security in the household. This information may be useful for understanding how management measures may impact upon the livelihood of resource users and the food security of households. For example if households primarily consume their catch, then a restriction on fishing can be expected to affect food availability and therefore impact food security of the household.

K26. STAKEHOLDERS

What it is

Stakeholders are individuals, groups or organisations of people who are interested, involved or affected (positively and negatively) by coastal resource management. These stakeholders may or may not actually live within or adjacent to the site, but are people who have an in interest in or influence on coastal resource management. See *GCRMN Manual, Chapter 1: Preparatory Activities, Identify the reef stakeholders* for further discussion.

How to collect the data

Key informants (e.g. government officials, elected officials, fishers, business leaders, fish traders) in the area are interviewed to identify the three main stakeholder groups for each coastal activity (e.g. fishing, aquaculture, tourism). The coastal activities are identified as part of the variable, *activities (K14)* and noted in the *Secondary Source/Interview Guide* table as illustrated.

Additional data collection: In order to understand power structures (political, economic and social) within the community, key informants may be asked how much the various stakeholder groups influence each other.

How to analyse the data

Summarise the data from the key informants into the table in the *Interview/Secondary Source Analysis Sheet* as shown.

Additional analysis: A short narrative may be prepared to describe the stakeholder groups involved in each coastal activity.

Coastal Activity*	Stakeholder Group 1	Stakeholder Group 2	Stakeholder Group 3
Fishing	Subsistence/ recreation	Commercial	Trawlers etc
Aquaculture	Aquaculture owners, managers & staff		
Tourism	Hotel owners, managers and staff	Watersports operators	Tourists
*develop list according to activities identified in *activities (K14)*			

How the information can be useful to managers and other stakeholders

Coastal resource managers have come to realise that the active participation of coastal resource stakeholders in planning and management can improve success of coastal resource management. If local people are involved in coastal resource management and feel an ownership over it, they are more likely to support coastal resource management. An understanding of stakeholders will allow the manager to better identify individuals that may be impacted by management measures and to address these impacts with these stakeholders.

Stakeholders are also identified to determine which ones should be the focus of the monitoring. Identifing all the stakeholders will provide the opportunity for stakeholders to ensure that **all** user groups are included in management activities and potentially benefit from programmes specifically suited to their needs.

K27. TOURIST PROFILE

What it is

Tourist profile refers to characteristics of tourist visitors to the study site. Tourists may be both national and foreign.

How to collect data

Data on tourists is collected at the study site level. Data on tourists can be collected from several sources, such as the national tourist board, local tourist board, department of immigration, census bureau, non-governmental organisations, businesses (e.g. hotels), and tourist attractions (e.g. marine reserves, national parks). Most countries will have tourist and travel statistics compiled and presented in a report. Additional data may be obtained from key informants such as a director of tourism board, a hotel marketing director, and travel agents.

The questions to address are:

How many visitors are there in total per year? _____

How many tourists visit from the following countries?:
(home country)_____; (write-in country)_____; (write-in country)_____;
(write-in country)_____; (write-in country)_____

How many tourists visit in the following months?:
January_____; February_____; March_____; April_____; May_____; June_____; July_____; August_____; September_____; October_____; November_____; December_____

How many tourists arrive by the following means of transportation?: air_____; cruise ship_____; other_____

What percent of the tourists are in the following age categories?: 0-18 _____; 19-30_____; 31-50_____; over 50_____

What percent of the tourists are male or female?: male _____; female_____

What percent of the tourists are interested in the following activities?:
nature _____; beaches _____; diving/snorkelling _____; fishing _____;
culture _____; other _____; other _____

Additional data collection: The team may also want to collect this data at the national level for comparison purposes. Additional data may be collected such as average length of stay, average daily expenditure, destinations and types of accommodations.

How to analyse the data

Much of the data may already be analysed and available in annual reports. The secondary source and key informant data may be summarised into the table in the *Interview/Secondary Source Analysis Sheet* to provide a profile of tourism in the study area.

Additional analysis: If time series data on tourism is available, trends and changes in tourism characteristics in the study area can be analysed.

How the information can be useful to managers and other stakeholders

Tourism profile is important for the manager to understand threats and opportunities from tourism, such as level of pressure on the marine and coastal resources. The information on changes over time can be useful in determining if these pressures are increasing, decreasing or staying the same. Comparisons with the variables *activities (K18), use patterns (K20) and levels and types of impacts (K23)* can be useful to determine how change are influencing resource conditions. Also it may be important for managers to make decisions on other resource activities if tourism is declining and the community is then losing out on tourism related benefits.

The information on demographics (age, nationality, gender) can indicate different demands for tourism goods and services. For example, younger people are likely to be more active than older tourists and, therefore possibly place greater pressure on the resources. Similarly, understanding tourists' interests and seasonality is also useful for predicting which resources will be under greatest pressure and when.

Understanding tourists' interests better will also help stakeholders adapt their businesses to the demand. It will also be an opportunity for the management and tour operators, fish guides etc. to work together and design a strategy to mitigate the pressure on the resources and educate the tourists on the marine and coastal environment issues of the area.

GOVERNANCE, INSTITUTIONS AND DECISION MAKING BODIES

K28. MANAGEMENT BODY

What it is

A management body is an institution that governs how coastal resource management is undertaken and ensures that there is a transparent process for planning, establishing and enforcing rules and regulations. Management bodies may be government, non-government or community organisations and may operate at the international, national, state/provincial or local level. There may be multiple management bodies in the study area for different coastal activities such as coastal zone management, fisheries, aquaculture, mangroves, tourism, marine transportation and residential development.

How to collect the data

Information on management bodies may be obtained by reading the management plans for the various activities. This information may also be obtained by interviewing key informants who are knowledgeable about coastal resource management or coastal activities (e.g. government agency representatives, elected officials, representatives of non-governmental organisations). It is important to confirm the existence and name of each management body for each coastal activity by identifying and interviewing a person responsible for the management body's operation. The information on whether a management body exists (yes or no) and the name of the management body is recorded in the *Secondary Source/Interview Guide* table as shown.

Coastal activity*	**Management body(s) (Yes/No) & Name**
Fisheries	Y – Dept. of Fisheries
Tourism	Y – Tourism Authority
Aquaculture	N
*develop list according to activities identified in *activities (K14)*	

Additional data collection: Key informants may also be asked to identify the mandate and key leaders of each management body for each coastal activity.

How to analyse the data

Summarise the data from the management plans, key informants and responsible persons into the table in the *Interview/Secondary Source Analysis Sheet* as illustrated.

How the information can be useful to managers and other stakeholders

Information on management bodies is useful for determining the overall impacts of management on communities, particularly on governance. The identification of a legally mandated decision-making authority for coastal activities will allow the manager to better understand the range of management activities taking place in the area, coordinate with the other management bodies, be more transparent in the management process and be more effective in terms of management. Also, the identification of management bodies will provide those with concerns about the impacts of management measures with which authorities to consult.

K29. MANAGEMENT PLAN

What it is

The management plan sets out the strategic directions for the coastal resources management programme. The management plan is a document that states the overall management programme goals and objectives, the institutional structure of the management system and a portfolio of management measures.

How to collect the data

Information on management plans can be obtained through interviews with key informants from the relevant national, regional and local government agencies with authority and responsibility for coastal resource management. There may be several management plans in existence for the study area depending on the coastal activities, including an integrated coastal zone management plan, a fisheries management plan, a coastal development plan, a mangrove management plan and/or a tourism development plan. It may be useful to request a copy of the relevant management plans to help determine what activities are addressed.

For each coastal activity, identify whether (yes or no) a management plan exists and note it in the *Secondary Source/Interview Guide* table as illustrated.

Coastal activity*	**Management plan (Yes/No)**
Fisheries	Y
Tourism	Y
Aquaculture	N
*develop list according to activities identified in *activities (K14)*	

Additional data collection: Information on the management plan components (e.g. enforcement, education) can also be collected when asking about the plan.

How to analyse the data

Note the data from the various key informants and secondary sources into the table in the *Interview/Secondary Source Analysis Sheet* as shown.

Additional analysis: It may be useful to give a description of the plan for each coastal activity. It may also be useful to compare the changes in the existence of management plans over time with changes in use patterns and resource conditions to determine if there is a correlation.

How the information can be useful to managers and other stakeholders

Knowing whether management plans exist for various activities is useful for determining the overall impacts of management on the study area, particularly on governance. The existence and adoption of a management plan informs managers that coastal resource management is guided by goals and objectives to achieve certain outcomes (for example, conservation and protection), that there is a basic strategy to achieve these goals and objectives and that the overall plan has a legal mandate for implementation.

The analysis comparing the existence of a management plan and other governance variables (e.g. formal rules and tenures) with resource use patterns and resource conditions is useful for determining whether these governance measures are influencing behaviour and the health of the resources.

Knowing whether a management plan exists for the different activities will enable stakeholders to consult these plans, and with management, determine the impact of management on the study area.

K30. ENABLING LEGISLATION

What it is

Legislation is the formal legislation in place from government to provide coastal resources management with a sound legal foundation so that the plan, management structures, rules and regulations, and enforcement procedures can be recognised, explained, respected and enforced. These can be both enabling and disabling for different stakeholders. For example, a national fisheries law or code is considered to be enabling legislation since it defines how fisheries will be used and managed in the country.

How to collect the data

Information on enabling legislation is obtained by interviewing key informants from relevant national, regional and local government agencies with authority and responsibility for coastal resource management. During the interviews it may be useful to request copies of the published legal documents of pertinent enabling legislation to help determine the enabling legislation that is in place.

Activity (develop list according to activities identified in *Activities [K14]*	Enabling legislation (Yes/ No)
Fisheries	Y
Tourism	N
Aquaculture	N

Enabling legislation may exist at international, national, state/provincial, and local levels. The form and extent of enabling legislation for coastal resources management will vary widely by country. The legal arrangements may depend upon many elements, including the form of government, available finances, public administrative structures, level of government, state of centralisation/decentralisation, lines of jurisdiction and decision-making, and types of coastal resources and activities.

The interviews and document reviews are conducted to determine the existence (yes or no) of enabling legislation to support the management plan for each coastal activity.

How to analyse the data

Note the information from the various key informants and secondary sources into the table in the *Interview/Secondary Source Analysis Sheet* as shown.

Additional analysis: It may be useful to explain the enabling legislation for each coastal activity in a short description. Compare the changes in the existence of enabling legislation over time with changes in use patterns and resource conditions to determine if there is a correlation.

How the information can be useful to managers and other stakeholders

Enabling legislation is useful for determining the overall impacts of management on communities in the study area, particularly on governance. An understanding of the enabling legislation is useful to ensure that the management plan and strategies are supported by adequate legislation for their successful implementation. An understanding of the enabling legislation will ensure that any management measures undertaken are supported in the law. Concerns over impacts of the management measures can be related back to the management plan and enabling legislation.

The analysis comparing the existence of enabling legislation and other governance variables (e.g. formal rules and tenures) with resource use patterns and resource conditions is useful for determining whether these governance measures are influencing behaviour and the health of the resources. Improving the understanding of existing laws will help stakeholders operate within the law.

K31. MANAGEMENT RESOURCES

What it is

Management resources refers to the human and financial resources that carry out the activities of the management plan.

How to collect the data

Information on management resources can be collected by interviewing the manager or director of each management body in the study area. The manager or director is requested to present the organisation chart which should identify staff allocations by programme or activity. The number of staff (full-time, part-time, volunteer) assigned to each programme or activity is identified. Where no organisation chart exists, one can be developed with the manager or director by first identifying each of the programmes or activities of the management body and then identifying the staff members. The manager or director is also asked for the overall

Coastal Activity*	Number of staff	Budget
Fisheries	5	1,000
Tourism	25	25,000
Aquaculture	0	0
*develop list according to activities identified in *activities (K14)*		

budget for the management body and for implementation of the management plan. The responses are noted in the *Secondary Source/Interview Guide* table as illustrated.

Additional data collection: Additional information may be collected on individual line item budget allocations for different management activities, such as education or enforcement. Information may also be obtained on technical and equipment allocations for various management activities.

How to analyse the data
Note the information from the various key informants and secondary sources into the table in the *Interview/Secondary Source Analysis Sheet* as shown.

Additional analysis: An explanation on current staff allocations and budget for coastal management may be provided.

How the information can be useful to managers and other stakeholders
Understanding management resources is useful for determining the overall impacts of management on communities in the study area, particularly on governance. For example, an understanding of the staff allocations to undertake each programme or activity is useful in order to understand the importance of the various activities and also for estimating the number and frequency of certain activities, such as enforcement patrols. The extent of management resources is also an indication of how effective management is, and its ability to achieve its goals and implement the management plan.

This information will be useful for other stakeholders to appreciate the importance given to the marine and coastal resources management, resources on which they depend for their livelihood.

K32. FORMAL TENURE AND RULES

What it is
Formal tenure is concerned with use rights with respect to coastal activities. Formal tenure is considered to be legally written into law. For example, a formal tenure arrangement is the right given to a fisher to access an area to fish.

Formal rules are legally written into law and define specifically what acts are required, permitted and forbidden by stakeholders and government agencies concerning the use of coastal resources. Rules establish how use rights are to be exercised. For example, for those fishers with a formal tenure use right to access an area to fish, a formal rule is that they may only use handlines to fish in the area.

For this variable the focus is on formal operational rules and regulations which directly affect day-to-day decisions made by resource users concerning when, where and how to use coastal resources. These rules and regulations are specific to a coastal activity and will be established by an agency with legal responsibility for managing that coastal activity.

How to collect the data
Formal legislation concerning tenure can be identified from secondary information such as written legislation at the national, regional or local levels. This legislation is written and legally published by the government. These include the national fisheries code or law, environmental laws concerning extraction of mangroves, laws concerning coral use and extraction, and laws concerning coastal residential development. Additional information can be obtained from key informant interviews with government officials in relevant agencies with responsibility for managing each coastal activity.

Formal rules and regulations can be identified from secondary information such as written legislation at the national, regional or local levels. This legislation is written and legally published by the relevant government agency. Additional information can be obtained from key informant interviews with government officials in relevant agencies with responsibility for managing each coastal activity.

Coastal Activity*	Formal tenure and rules (Yes/No)	Relevant rules and regulations (Yes/No)
Fisheries	Y	Y
Tourism	N	N
Aquaculture	Y	N
*develop list according to activities identified in *activities (K18)*		

The formal legislation concerning tenure and the formal rules for coastal activities should be obtained at national, regional and local government levels. For each coastal activity, identify (yes or no) if there exists a formal tenure arrangement(s) and a formal rule(s) at the community level. This information is noted in the *Interview/Secondary Source Guide* table as illustrated.

How to analyse the data
Summarise the data from the various key informants and secondary sources into the table in the *Interview/Secondary Source Analysis Sheet* as shown.

Additional analysis: It may be useful to describe the formal tenure arrangements and rules for each of the coastal activities. Compare the changes in the existence of *management plans (K29)* over time with changes in *use patterns (K20)* and *perception of resource conditions (S16)* to determine if there is a correlation.

How the information can be useful to managers and other stakeholders
Formal tenure is useful for determining the overall impacts of management on communities, particularly on governance. The formal tenure over coastal resources ranges from full ownership and control over the uses and allocation of coastal resources by certain groups, such as a fisher organisation, to no legal use rights at all. For the manager, it is critical to understand this information so that management arrangements can be equitably and efficiently designed and implemented, and the impacts understood and addressed. It is necessary to understand the existence, nature and strength of formal tenure that local stakeholders, including the management authority, have over coastal resources in the area so that management structures can operate effectively.

This variable is useful to determine the existing levels of control over human activities in the coastal area and the extent to which people are likely to accept additional rules governing use of coastal activities and be impacted by the formal rules. Resource users may violate rules if they are not well understood or if the rules don't make sense to them.

Comparing the existence of formal tenure arrangements and rules with resource use patterns and resource conditions is useful for determining whether these governance measures are influencing behaviour and the health of the resources.

By being aware of formal tenure rules, stakeholders will be able to operate within the rules. Furthermore, stakeholders may be able to help contribute to increase the compatibility of these rules to informal tenure and rules, customs and traditions.

K33. INFORMAL TENURE AND RULES, CUSTOMS AND TRADITIONS

What it is
In many coastal communities, a dual system of coastal resource management exists. An informal management system, devised and implemented by a community of resource users, often coexists with a formal government management system. These informal systems may be complex or simple, easily observed or carefully protected.
Customs and traditions for coastal resource use and management are practices that reflect the social and cultural ethnic, class or gender make-up of the community. They may include, for example, the identification of a senior fisher to direct fishing activities, the saying of prayer before fishing, a conflict management mechanism or a decision-making arrangement.

Informal tenure and rules refer to the unwritten, informal (customary and traditional) practices through which people gain use rights, and define specifically which acts are required, permitted and forbidden by resource users with respect to coastal activities. It also refers to the level of compliance of these informal rules.

How to collect the data
Information on informal tenure and rules for each coastal activity (as appropriate) can be obtained by a combination of key informant interviews and observation. The most relevant people for key informants include senior community members and government officials. Key informants are asked to briefly describe the customs/traditions, informal tenure and rules for each coastal activity as noted in the *Secondary Source/Interview Guide* table below. They are then asked for each tenure and rules, customs/traditions whereas, the level of compliance by community members (High, Medium or Low). Observation is also essential because information obtained through interviews may only reflect ideal, not real, behaviour. Resource users can be observed as they carry out the informal tenure and rules to determine if they are being implemented as described.

Coastal activity*	Customs and traditions	Informal tenure arrangements	Informal rules	Level of compliance (High, Medium, Low)
Grouper fishing	Closed area or season around grouper spawning activity			
*develop list according to activities identified in *activities (K14)*				

When collecting information on informal governance, it should be noted that it may take more time to fully understand these arrangements. This may involve spending additional time with community members to actually learn in detail about these systems. It will also be useful for the team to understand which groups (user, age, genders, outsiders) comply or not with the informal rules, tenure, customs and traditions.

How to analyse the data
Note the information from the key informants into the table in the *Interview/Secondary Source Analysis Sheet*.

Additional analysis: It may be useful to describe the informal tenure and rules and the customs and traditions related to coastal resource use and management for each of the coastal activities in a brief explanation.

How the information can be useful to managers and other stakeholders
Customs and traditions for coastal use and management and informal tenure and rules are useful for determining the overall impacts of management on communities and for understanding the cultural significance of resources and their uses. An understanding of informal tenure and rules is important since resource users may feel that the informal tenure and rules are more legitimate to them than formal use rights and rules, and thus disregard laws and legislated restrictions. An understanding of informal tenure and rules will allow the manager to develop a management programme that respects customs and traditions and builds on these arrangements, while also including legislated measures. This may be more acceptable to resource users and lead to higher levels of compliance. By understanding these customs and traditions, the manager can recognise and integrate them in the management programme so as to minimise or have no impact on social and cultural practices in the community. Understanding whether these rules and traditions are respected and by whom will help the managers appreciate better the impact of integrating them in the management regime being developed.

Also informal tenure and rules can also provide a traditional method of protection for natural resources, such as closed seasons, taboo areas, and may comprise an integral part of the management plan for the area that will complement formal management schemes.

Understanding informal tenure rules and customs and traditions of other stakeholder groups, will help improve relationships and respect between stakeholders if conflicts are an issue in the study area. By providing information on informal rules and traditions, stakeholders can ensure managers are aware of them and try to integrate them in the management programmes.

K34. COMMUNITY INCENTIVES

What it is
Community incentive relates to existing incentive programmes established to promote community involvement in better management of marine and coastal resources. These may include bed/nights levies (e.g. a percentage of the fee paid by a tourist is given to community trust or fund), community funds, micro credit schemes

How to collect the data
Information is collected with key informants such as stakeholder representatives, coastal managers, president of the hotel association, president of the fisher's association etc. Respondents are asked to list the community incentives that they have access to or are developing in order increase conservation benefits to communities and/or promote stakeholders' involvement in management activities.

How to analyse the data

Note the information from the key informants into the *Interview/Secondary Source Analysis Sheet* as shown below:

Stakeholder group	Type of incentive
Large hotels	30USD per Bed/night to local community trust
Dive centre	Diving fee to dive in MPA to community trust
Fishers	Subsidised prices for buying traps and reduce seine nets use from the Fisheries Department

Additional analysis: Compare changes in community incentives and changes in *level of impacts*, changes in *types of use (K16)* and the changes in *use patterns (K20)* over the years.

How is this useful to the manager and other stakeholders

Knowing incentives programmes exist is useful for determining their overall impacts on the management of resources in the study area. The managers can gauge whether a type of incentive works more than another and if they are useful in increasing stakeholders' involvement in management activities.

Knowing these schemes exist will increase the transparency of their use in the communities for example. Increasing the stakeholders' awareness of these community incentives will also enable stakeholders to apply for them and become involved.

K35. STAKEHOLDER PARTICIPATION AND SATISFACTION

What it is

Stakeholder participation and satisfaction is a measure of the extent of people's involvement in coastal management (decision-making and implementation) and how satisfied they are with their current level of involvement. Implementation activities include activities such as enforcement, awareness raising, monitoring.

How to collect the data

Stakeholder participation (from no participation to fully active participation) and satisfaction (High, Medium, Low) can be obtained through key informant interviews with community officials, leaders, stakeholder organisations, coastal management staff, and/or focus groups with representatives of stakeholders. As noted in the *Secondary Source/Interview Guide* table below, informants are asked about the level of involvement of stakeholders in making coastal management decisions and in the implementation of activities (1= no participation; 5= Fully active participation) and whether they are satisfied with their level of involvement (High, Medium, Low).

Stakeholder group*	Activity**	Stakeholder participation (1 to 5)***	Level of satisfaction with participation (H/M/L)
Fishers	Decision making	3	H
	Monitoring	1	M
	Enforcement	2	L
Fish traders	Decision making	1	M
	Monitoring	1	H
	Enforcement	1	M
*develop list according to stakeholder groups identified in *stakeholders (K26)* ***Develop list of management activities according to the management plan if it exists (K29)* ***1=no participation, 5=fully active participation			

Additional data collection: Stakeholder participation can also be obtained through observation of coastal management meetings to see if the stakeholders attend the meetings and express their opinions, and determine if their opinions are considered by the

management body. The team may find it useful to investigate why people are not happy with their level of involvement and how it may need to change.

How to analyse the data
Note the data from the key informants and observations into the table in the *Interview/Secondary Source Analysis Sheet.*

Additional data analysis: It may be useful to provide an explanation on the level and types of stakeholder participation in coastal management.

How the information can be useful to managers and other stakeholders
The active participation of stakeholders in coastal management can improve the success of coastal management activities. If stakeholders are more involved in decision-making and implementation and feel ownership over the process, they are more likely to support coastal management activities. Stakeholder support is important for the success of coastal management.

By monitoring participation over time, the manager can see how effective the programme has been in engaging stakeholders in management, often an objective of management. Monitoring the level of satisfaction of the stakeholder with their level of involvement in the coastal and management process will also provide feed back on the satisfaction of stakeholders with the management programmes and the likelihood of their sustained support.

The level of stakeholder participation is useful to understanding the importance of the coastal resources to the public. The more people value the resources, the more likely they are to participate in management. There are other reasons as well, such as a crisis situation (e.g. oil spill), but generally the level of stakeholder participation can be used to demonstrate the importance of the resources.

Monitoring the level of participation and satisfaction with the participation will give stakeholders an opportunity to give feedback to managers on the management process to managers. It will help stakeholders help managers to target efforts on specific stakeholders.

K36. COMMUNITY AND STAKEHOLDER ORGANISATIONS

What it is
Community and stakeholder organisations are means for representing resource users and stakeholders in coastal resource management and for influencing the direction of decision-making and management. These can be both formal and informal institutions /bodies.

How to collect the data
Information on community and stakeholder organisations is obtained from secondary sources and from interviews with key informants or focus groups. Key informants and focus groups may include officials from the coastal resource management agency offices, other relevant government officials, community leaders, members of other associations in the community, senior fishers, representatives of religious organisations and representatives of non-governmental organisations.

As noted in the *Secondary Source/ Interview Guide* table, for each organisation information is collected on whether the organisation is formally or informally authorised and on the organisation's main functions. Key informants are asked whether the organisation influences coastal management issues, community issues, both coastal management and community issues, or has no influence.

Community organisation	Formal or informal	Main functions	Influence (on coastal manage-ment; community issues; both; none)

How to analyse the data
Summarise the data from the key informants, focus groups and secondary sources into the table in the *Interview/Secondary Source Analysis Sheet.*

Additional analysis: Identify the number of community and stakeholder organisations, whether they are formal or informal, and their functions/responsibilities. Calculate the percentage of informal and formal organisations.

How the information can be useful to managers and other stakeholders
An understanding of community and stakeholder organisations can assist managers in improving participation and representation of stakeholders in management and decision-making. The results need to be interpreted against the background of the level of community or collective action in the country or area. An understanding of organisations will allow the manager to identify different groups that may be impacted by management measures and to address these impacts with the organisations.

By having a better knowledge of the different stakeholders organisations, stakeholders will have a better understanding of their level of representation in coastal resource management and the potential power to influence decision making. It may show the need for increased collective action.

K37. POWER AND INFLUENCE

What it is
Power and influence refers to which individuals or groups hold influence in the community particularly in relation to access, use and control of marine and coastal resources.

How to collect the data
Information on power and influence is obtained from interviews with key informants or focus groups. Key informants or focus groups will include representatives of the different stakeholder groups who are familiar with the resource control and access mechanisms within the community. Gender and age are often of importance, selection of groups and/or key informants will have to take this into consideration.

Additional data collection: The team may also want to investigate if there are conflicts between stakeholders.

Key informants/ groups or stakeholders will be asked for identified *activities (K14)*:

List which organisations or individuals are involved in making decisions about your activities (i.e. where, when, how, and who can carry out this activity)?_____

Who (activity, age, gender) else (not necessarily part of an official process) **has** to be consulted for the activity to be carried out, expanded or changed?_____

Where do you get information from about marine and coastal resources (e.g. NGO, social group, news paper)?_____

How to analyse the data
Summarise the information in the *Interview/Secondary Source Analysis Sheet* and rank groups, individuals and source of information according to the number of times they have been mentioned (the more frequently mentioned; the more powerful and therefore the higher the rank).

How is this information useful to managers and other stakeholders
Groups/individuals who hold power and influence in a community are often crucial to the success of any activity in this community whether they are directly involved with coastal and marine resources or not. Thus, understanding who these groups are will enable the manager to ensure that they are considered in management interventions and increase management effectiveness.

Clarifying who holds power and influence will help the community members to refine decision making processes to improve the management of their activities.

SURVEY VARIABLES (S)

HOUSEHOLD DEMOGRAPHICS

S1-8. *AGE/SEX RATIO, GENDER, EDUCATION, ETHNICITY/CASTE/TRIBE, RELIGION, LANGUAGE, OCCUPATION, HOUSEHOLD SIZE*

What it is

As described in the previous *Key Informant/Secondary Source Variables* section, age, gender, ethnicity, education, religion, language, occupation and household size and structure are basic demographic variables. The team will be able to investigate the household size and structure at the household level. The household size indicates the average size of households in the study area. The household structure relates to whether the household is headed by a man or a woman (widow or not). Household structure also relates to the average number of men, women and children compose the household.

Additional data collection: At the household level, the team may want to ask more details about foreign languages spoken by household members. This could provide information on whether local communities are in a good position to be able to take opportunities offered by an emerging or potential tourism sector.

The team may also want to ask about the existence of illegal occupations, such as fish poaching and smuggling. It should be noted that this may be a highly sensitive issue and, therefore it may be easier to obtain this information from key informants (see *K12*).

How to collect the data

Information on all these demographic variables (S1-8) is collected by asking about all the members in the respondent's household. In this way, the team collects information on the range of demographic characteristics of members of the household, not just about the individual respondent.

The team asks the respondent to complete the following table as noted in the *Survey Guide*. Each household member is noted in the first column and the relevant information provided to the right:

Household members*	Age	Gender	Education level completed (only ask if >16 yr)	Religion**	Ethnicity	Language (spoken)	Primary occupation	Secondary occupation
HH								

* identify all living in respondent's house by name or role (e.g. grandmother)
** Information on religious affiliations may be too sensitive to ask at the household level. It may be more appropriate to get it at the community level by key informant or secondary sources.
HH: indicate who is the household head (e.g. mother) and if a woman whether she is a widow (w).

How to analyse the data

Occupation analysis

For the occupation analysis, first identify all the occupations noted during the interviews and list them in the table in the *Survey Analysis Sheet* (see example below). For simplicity, group all the occupations that have less than 5% of the population together under "Miscellaneous."

Next calculate the total number of people from all the household tables who listed this occupation as their primary occupation. Then calculate the percentage of people who are employed in each occupation as their primary occupation by dividing the number

of people noted for each occupation by the total number of people in all the households as noted in the *Survey Analysis Sheet* and illustrated in the table.

Conduct the same calculations for the secondary occupations by first calculating the total number of people from all the households who noted each occupation was their secondary occupation. Then calculate the percentage of people from the households who noted each occupation was their secondary occupation by dividing the number of secondary people for each occupation by the total number of people in all the households interviewed as illustrated in the table. Also note that the total percentage of household members with secondary occupations is less than 100%. This is because not all household members have a second occupation. In the example below, 80% have secondary occupations, 20% do not.

Finally, add the percentages from the primary and secondary occupations for each occupation to determine the total percent of community members dependent on each occupation as illustrated in the table. Note that the total adds up to more than 100%. This is because the total percent includes primary and secondary occupations of household members. They are therefore counted twice if they have a second occupation.

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**	
Fishing	65	32.5%	50	25%	57.5%
Hotel development	50	25%	20	10%	35%
Aquaculture	30	15%	60	30%	45%
Misc.* (coral mining, farming)	5	2.5%	30	15%	17.5%
No occupation**	50	25%	0	0%	25%
TOTAL	200	100%	160	80%	180%
* record together all occupations that were noted for <5% of the household members ** for example, unemployed, students, retired					

Additional analysis: Compare these results with the data from the key informant/secondary source *occupation (K7),* which asks the percent of population conducting this occupation as primary occupation and secondary occupation. If there are significant differences, then consult with the key informants to determine the cause. If the difference cannot be explained, then it may be necessary to interview all the households to accurately determine occupational structure. Note that the key informant/secondary source data are based on the *working* population and therefore do not include people who are students, retired or otherwise not working. To accurately compare, the household percentages will need to be recalculated based only on the people listed as working (i.e. not including the people who noted "student", "unemployed", etc., as their occupation).

Compare changes in the number of people in each occupation over time with data on changes in *types of use (K16)*, *levels and types of impact (K23)*, and resource conditions over time to identify any correlations.

Also, calculate changes in occupational structure over time. Take the current year's percentages and numbers and subtract the previous year's to see if there is an increase, decrease or no change.

Demographic analysis: For each primary occupation, calculate the percent of people in each age category, education category, ethnic category, religious category and gender category and note these percentages in the *Survey Analysis Sheet* (see example below for age and education table).

Percent Responses							
Primary Occupation	Age 0-15	Age 16-25	Age 26-45	Age over 45	< 6 years schooling	6-9 years schooling	>9 years schooling
Fishing	6%	20%	39%	35%	10%	60%	30%
Hotel development	0%	45%	30%	25%	5%	30%	65%

Additional analysis: Compare these demographic data for all the occupations together with the *Interviews/Secondary Source, age, gender, education, literacy, ethnicity, religion and language (K5-11)* data. If there are significant differences, then consult with the key informants to determine the cause. If the difference cannot be explained, then it may be necessary to interview all the households to accurately determine community demographics. In addition, a short narrative may be prepared describing the characteristics of each occupational group.

Household size analysis and household structure: Calculate average household size by adding up the number of people in each household and dividing by the number of households.

How the information can be useful to managers and other stakeholders

In addition to the demographic data provided from the key informants/ secondary sources, the data from the surveys are analysed specific to each occupation. This provides the manager with an understanding of the type of person employed in the different occupations that can help him/her tailor management programmes. For example, if the manager knows most of the aquaculture owners are illiterate and most of the hotel owners are highly educated, then he/she may develop education programmes based on visual imagery for the aquaculture owners and an education programme based on scientific references for the hotel owners.

Women headed households and particularly widow headed households have a tendency to be poorer in the community. The manager can tailor programmes for these households which may be identified as particularly vulnerable groups to changes in resource management.

By contributing to the gathering of information on the make up of the communities, stakeholders will help ensure that managers have a good knowledge of the wide spectrum of stakeholders and are able to design management activities that are better suited to their context.

S9. HOUSEHOLD INCOME SOURCES

What it is

Household income refers to the main sources of income for a household. This information is collected in addition to occupational structure to identify any sources of income that are not associated with an occupation, such as remittance from abroad.

How to collect the data

As noted in the *Survey Guide*, data on household incomes are obtained by asking each respondent:

What is your household's most important source of income? _____
What is your household's second most important source of income? _____

Note that the collection of this data could be sensitive to some individuals as it is personal. The team needs to carefully consider their study area and community members to determine if it is appropriate to ask this question.

How to analyse the data

For each occupation, calculate the percent of respondents that noted it was their household's primary source of income and the percent of respondents that noted it was their household's secondary source of income, and note these percents in the *Survey Analysis Sheet*.

Additional analysis: Compare these results with the data on *occupation (K12 and S1)* to verify the same occupations are of critical importance. Note that there may be differences due to sources of income that are not occupations (e.g. remittance). Monitor these results over time to identify changes in the importance of the various occupations.

How the information can be useful to managers and other stakeholders

Information on primary and secondary sources of incomes is useful for determining the importance of the resources to the community. For example, if over 80% of the community considers fishing a primary or secondary source of income, then this demonstrates a high community dependence on fishing and consequently on the marine resources.

By better understanding the importance of different activities for their income, communities can make an informed contribution to help managers improve management activities and take into consideration the impact of some rules and regulations on the stakeholders' main livelihoods.

S10 HOUSEHOLD ACTIVITIES

What it is

Household coastal and marine activities is the identification of the household uses of coastal and marine resources in the study area.

Coastal and marine activities

1. Subsistence Fishing

2. Reef gleaning

3. Boulder, sand collection

4. Tourism

How to collect the data

The respondent is asked to identify all uses of coastal and marine resources by household members. This information is noted in the survey Guide table as illustrated.

How to analyse the data

The data from all the household surveys are sorted and ranked according to the most important activities by all the households. The activity reported most often by the households should be listed first, followed by the second most often reported activity, etc. This information is noted in the *Survey Analysis Sheet* as shown.

Additional Analysis: A narrative may be prepared describing the different coastal and marine activities of households in the community.

How the information can be useful to managers

The identification of household coastal and marine activities is important for the manager to have an understanding of the various uses of coastal and marine resources in the area and the dependence of households on certain activities.

S11 HOUSEHOLD GOODS AND SERVICES

What it is

Coastal and marine goods and services are the specific products produced from the household coastal and marine activities. These include extractive goods such as fish, mangrove wood, coral products and sand; and non-extractive services such as tourism/recreation activities and aquaculture.

How to collect the data

The respondent is asked to identify all goods and services produced from each coastal and marine activity of the household. This information is noted in the *Survey Guide* table as illustrated.

How to analyse the data

The data from all the household surveys are sorted and ranked according to the most important coastal and marine goods and services from each activity for the households. The good or service

Coastal and marine activities	Coastal and marine goods and services
1. Fishing	Grouper
	Octopus
	Bait
2. Gleaning	Cowries
	Octopus
	Recreational fishing

reported most often by the households should be listed first, followed by the second most often reported good or service, etc. This information is noted in the *Survey Analysis Sheet* as shown.

Additional analysis: It may be useful to explain the household coastal and marine goods and services in the community in a short description.

How the information can be useful to managers

Information on household coastal and marine goods and services is useful for determining the overall impacts of management, particularly marketing and production on households in the study area. As a result of management measures, there may be a change in the coastal and marine goods and services produced in the area, with positive and negative impacts on the household. For example, if a marine protected area actively promotes tourism in the area, then it would be expected that the value of diving industry related activities would increase and more household members would shift to working in this area.

S12 TYPES OF USE

What it is

Types of use identify the specific method or development being employed (e.g traps, nets, guesthouses, scuba diving) for each coastal and marine good and service (see *types of use (K16)* for more information.

How to collect the data

The respondent is asked to identify the specific method or development being used for each coastal and marine good and service. This information is noted in the *Survey Guide* table as illustrated.

How to analyse the data

The data from all the household surveys are sorted and ranked according to the most important coastal and marine goods and services from each activity for the households. The good or service reported most often by the households should be listed first, followed by the second most often reported good or service, etc. This information is noted in the *Survey Analysis Sheet* as shown.

Coastal and marine activities	Coastal and marine goods and services	Methods
1. Fishing	Grouper	Trap Line Boat and line
	Octopus	Spear Line
	Tuna bait	Net
2. Gleaning	Cowries	Rod
3. Tourism	Hotel development	Guesthouses All-inclusives
	Diving	Scuba
	Recreational fishing	25 people boats

Additional analysis: It may be useful to explain the household coastal and marine goods and services in the community in a short description.

How the information can be useful to managers and other stakeholders

Information on types of uses is particularly useful for identifying threats, such as mangrove clearing, to the coastal and marine resources. By monitoring this information over time, the manager can also see what impact management has had on these methods. For example, if the coastal management programme initiated a mangrove replanting campaign, yet mangrove clearing continues to be listed as a method, then this indicates that the campaign is not preventing continued mangrove clearing. This information also helps to determine the effectiveness of coastal management programmes.

Understanding what methods are taking place in the study area is also critical to developing stakeholder participation and awareness programmes in coastal management. The managers need to know how people are tied to the resources in order to work with them and communicate with them regarding threats to the resources.

S13 HOUSEHOLD MARKET ORIENTATION

What it is

Household market orientation is the identification of the market in which each coastal and marine product produced by the household is primarily sold. This household information can be used to determine market orientation of the entire community.

How to collect the data

For each coastal and marine good or service that the household is involved with, the respondent is asked to note the primary market in which it is sold (international, national, regional or local). The responses are noted in the *Survey Guide* table as illustrated. The team needs to define in advance the types of market orientation (international, national, regional or local) to ensure consistency in responses.

Coastal and marine activities	Coastal and marine goods and services	Methods	Target markets
1. Fishing	Grouper	Trap Line Cyanide	Regional
	Octopus	Trawl Line	Local
	Shrimp	Trawl	Regional
2. Gleaning	Cowries	Rod	Regional
3. Tourism	Hotel development	Guesthouses All-inclusive	International
	Diving	Scuba	National
	Recreational fishing	25 people boats	Local

How to analyse the data

List the goods and services and calculate the percentage of respondents who noted each good or service sold in international, national, regional or local markets. This information is noted in the *Survey Analysis Sheet* as shown. The definitions of types of market orientation (international, national, regional or local) should be noted. As shown in the sample sheet below.

(sample data) Coastal and marine goods and services	% Noted international market	% Noted national market	% Noted regional market	% Noted local market
Grouper	0%	30%	40%	30%
Octopus	0%	15%	35%	50%
Shrimp	20%	20%	35%	35%
Hotel development	60%	35%	3%	2%
Diving	50%	40%	8%	2%
Recreational fishing	10%	10%	30%	50%

Additional analysis: A narrative may be prepared describing the different markets in which goods and services are sold.

How the information can be useful to managers and other stakeholders

Market orientation information is useful for determining the overall impacts of management on communities, particularly marketing, production and food security. For example, investments in community infrastructure, such as roads to major cities, can result in greater access to national, regional and international markets.

Since the livelihood and income of people in the community are linked to markets, the fish market orientation is important as it provides for an understanding of where aquatic products produced in the area are sold. This variable allows for an analysis of

changes over time in the markets for major aquatic products. It shows the relationship of local producers and traders with various markets, for example, linkages with international markets, which may affect harvesting practices.

Target markets information can also be useful as an indication of how much pressure may be put on the resource. For example, fishers may put intense fishing effort on a high valued fish for international markets. It can also give an indication over time of shifts in markets for aquatic products. The impact of management measures can be assessed through changes in markets. For example, management measures may result in higher value fish being available in the area that may be marketed in regional or national markets.

S14 HOUSEHOLD USES

What it is

Household uses of coastal and marine goods and services are a measure of how households in the study area utilise coastal and marine goods and services for consumption, leisure and sale.

How to collect the data

Each respondent is asked to identify the primary household use for each good or service -- own consumption, recreation activity or sale -- which is noted in the *Survey Guide* table as illustrated.

Coastal and marine goods and services	**Coastal and marine goods and services**	**Household uses**
1. Fishing	Grouper	Own consumption
	Octopus	Sale
	Shrimp	Sale
2.Collecting boulder and sand	coral boulders, shingle sand	Own consumption, sale
3. Tourism	Hotel development	Sale
	Diving	Sale
	Recreational fishing	Recreation activity

Additional data collection: If food security is a concern, then the informants may be asked questions relating to food security. The informant can be asked to rank sources of protein according to prices (e.g. lowest price per kilo=1) and see how fish and other main products locally caught consumed at the household levels rank. The informants also can be asked how many times, per week or per month they consume marine products such as fish in relation to other common sources of protein (e.g. beef and goat). The seasonality of coastal activities must be taken into consideration in investigation the relative prices of marine products and in their consumption. Questions on the availability of marine products throughout the year consumed by households may also be asked, particularly if they are a relatively cheap source of protein.

How to analyse the data

Similar to the household market orientation variable, list the goods and services and calculate the number and percentage of respondents who noted each good or service used for own consumption, leisure or sale. This information is noted in the *Survey Analysis Sheet*.

If questions on the frequency of consumption of marine products are asked, group the responses into appropriate categories for frequency of consumption (e.g. more than 3 times per week, weekly but less than 3 times, once or twice per month, less than once per month but regularly, on special occasions, never). Do the same for other sources of protein. Then calculate the percentage of households in each category for the different sources of protein investigated. Compare the frequency of consumption of common meats and fish.

Look at changes over time. Compare changes in frequency of fish and other sources of protein with *material style of life (S28)* and see if they are correlated.

Additional analysis: It may be useful to describe the different household uses of the coastal and marine goods and services by the community and the different sources of protein available and their prices at the local level.

How the information can be useful to managers and other stakeholders
Information on households' use of coastal and marine goods and services provides insight into household dependence on coastal and marine resources for food and income. It is therefore important for understanding issues of food security in the household. This information can be useful for understanding how management measures may impact upon the livelihood of resource users and the food security of households. For example, if households primarily consume their catch, then a restriction on fishing can be expected to affect food availability and therefore impact food security of the household. Investigating the frequency of fish or other marine consumption can also increase the managers' understanding of the dependence on marine resources of the wider community.

Understanding better their dependence on marine and coastal resources for their livelihood and food security, the stakeholders will be able to help managers design better suited management activities ensuring that these take the level of dependence on marine resources into consideration.

ATTITUDES AND PERCEPTIONS, AND PARTICIPATION IN FORMAL/INFORMAL INSTITUTIONS

S15. NON-MARKET AND NON-USE VALUES

What it is
Non-market and non-use values of the coastal resources are measures of how people think about the value of coastal resources that are not traded in the market (non-market) and the value of the resources to the portion of society that does not use the resources (non-use). Non-market value is the value of resources (e.g. fish) and services (e.g. diving) that are not traded in any market. These include direct uses, such as divers who have travelled to dive by private means; and indirect uses, such as biological support functions in the form of nutrients, fish habitat and coastline protection from storm surge. Non-use values are not associated with any use and include option value (the value of knowing that the resource is available should one decide to use it at some future time), bequest value (the value of knowing that the resource will be available to future generations), and existence value (the value of knowing that the resource exists in a certain condition).

How to collect it
The concepts of non-market and non-use values are largely abstract and theoretical. Ideally, an economist should conduct the assessment of these variables since the economic methods used are complex. Recognising that in most areas economists are not readily available, *SocMon* suggests an approach of measuring people's perceptions based on scale.

This approach uses a series of questions that focus on people's perceptions of indirect non-market values (e.g. biological support functions) and the non-use values related to bequest and existence values of the resources. These could include statements about beauty, about looking after the sea for their children's children, about "enjoying time on the water", and about other non-extractive goods and services that a healthy coastal environment can provide.

One way of gathering information on non use value is to ask the coastal community (children, women men fishers) to say the first thing that comes to their mind when they think of a coastal or marine ecosystem, such as coral reefs, and ask them how they value this ecosystem. The statements collected should be grouped together under the different types of non use values.

Following are suggested statements, which need to be tailored to the resources and activities at each site. Each respondent is asked to indicate the degree to which they agree or disagree with a series of statements. Respondents are asked if they: agree strongly (5), agree (4), don't agree or disagree (3), disagree (2), or disagree strongly (1) with each statement.
_____ a) The reefs are important for protecting land from storm waves. (indirect non-market value)

_____ b) In the long-run, fishing would be better if we cleared the coral. (indirect non-market value)
_____ c) Unless mangroves are protected we will not have any fish to catch. (indirect non-market value)
_____ d) Coral reefs are only important if you fish or dive. (existence non-use value)
_____ e) I want future generations to enjoy the mangroves and coral reefs. (bequest non-use value)
_____ f) Fishing should be restricted in certain areas even if no one ever fishes in those areas just to allow the fish and coral to grow. (existence value)
_____ g) We should restrict development in some coastal areas so that future generations will be able to have natural environments. (bequest value)
_____ h) Seagrass beds have no value to people. (existence value)

Note that the statements are written such that agreement with some indicates an accurate or positive belief, while agreement with others indicates the opposite. This was done to control for responses where the respondent either agrees or disagrees with everything. Statements are randomly arranged with respect to this type of polarity.

Additional data collection: Certain marine and coastal-related activities or items may have important cultural value to the community. Respondents can be asked to list the various activities or items in the community (e.g. fishing, temple, reef) and to then rank them in order of cultural importance to the community. This is particularly useful for identifying activities and items that may not be important in terms of providing livelihood but are still considered an important part of community life. For example, in areas where fishing is being replaced by tourism, communities may still feel that fishing is part of the community even though it is no longer the primary source of income or livelihood.

Open-ended questions, such as: "If coral reefs disappeared, how would it matter to you?", "If the fisheries disappeared, how would it matter to you?", and "If the entire beach front were to be developed, how would it matter to you?", can be asked to gain a fuller understanding of the importance of the resources and their uses.

How to analyse the data
For each question, calculate the percent of respondents for each level of agreement and note the percent in the *Survey Analysis Sheet*. To determine whether respondents attribute a non-market or non-use value to the resources, consider to what extent they agreed with the statements. Statements a, c, e, f and g are positively stated. If respondents agreed with these statements, they value the resources. Statements b, d and h are negatively stated. If respondents agreed with these statements, they do not value the resources.

Additional analysis: The levels of agreement (e.g. agree strongly and agree) may be combined to simplify the interpretation. For example, if 23% of respondents *strongly agreed* with statement a and 34% of respondents *agreed* with statement a, then these could be combined to say, "over fifty percent of respondents agreed that reefs are important for protecting land from storm waves." This is easier to understand than listing the percentages for each category.

It may also be useful to explain to what extent people value the resources. Compare results over time to see if people's perceptions have changed.

How the information can be useful to managers and other stakeholders
Information on non-use and non-market values is useful for understanding how people value the coastal resources. Often valuations focus exclusively on values related to the market, such as employment levels, incomes and net profits. By also understanding perceptions of non-use and non-market values, the manager gains a more complete picture of the total value of the resources. This is useful for demonstrating the importance of the resources and their protection to policy-makers and the general public, gauging public support for management, and demonstrating that marine resources are more than products to be bought and sold.

These perceptions are also useful for developing awareness programmes because managers can see how much people think of resources as providing goods and services beyond what can be bought and sold. Monitoring this information over time can therefore be used to see how management programmes impact people's attitudes and perceptions.

Better understanding how different stakeholders value the resources may also help stakeholders understand each other better and improve their working relationship. It will also be an opportunity for the stakeholders to convey the importance of some of the resources (e.g. beyond their market value) to the managers and help them improve their protection.

S16. PERCEPTIONS OF RESOURCE CONDITIONS

What it is

Perceptions of resource conditions measure what people think about the condition of the coastal resources.

How to collect the data

Data on perceptions of resource conditions are obtained by asking each respondent:

How would you describe current conditions of each of the following resources using the scale of very good (5), good (4), not good or bad (3), bad (2) to very bad (1) (edit list of resources to reflect site resources): mangroves _____; coral reefs _____; fresh water (rivers) _____; upland forests _____ sea grasses_____

How to analyse the data

For each resource calculate the percent responses for each level of the scale and note in the *Survey Analysis Sheet*.

Resources*	**Percent respondents that described resource conditions as:**				
	Very good (5)	**Good (4)**	**Neither good nor bad (3)**	**Bad (2)**	**Very bad (1)**
Mangroves	3%	10%	30%	34%	23%
Coral reefs	5%	12%	34%	30%	23%
Fresh water	2%	15%	62%	15%	6%
Upland forests	40%	30%	20%	8%	2%
Seagrass	12%	18%	30%	27%	2%
*edit list of resources to local site					

Additional analysis: Some of the categories may be combined to simplify the interpretation. For example, if 23% of respondents said the mangroves are in very bad condition and 34% said they are in bad condition, then these could be combined to say, "over fifty percent of respondents noted the mangroves were in bad or very bad condition." This is easier to understand than listing the percentages for each category. In addition, a short explanation may be prepared describing how people perceive the resource conditions. Monitor these results over time to identify changes in people's understanding of resource conditions. Compare these results with scientific studies of resource conditions to determine the accuracy of people's understanding of resource conditions.

How the information can be useful to managers and stakeholders

Information on perceptions of resource conditions by resource users is useful for identifying threats to the coastal resources. By understanding which resources are in poor condition, managers can better identify the major threats to the resources since most threats are linked to particular resources. For example, if mangroves, seagrass and coral reefs are noted to be in worse condition than upland forests and fresh water, then sea-based activities, such as fishing and boating, may be a greater threat than terrestrial activities.

This information is also critical for developing awareness programmes and seeking stakeholder participation. If community members do not consider the resources to be at risk, then it will be difficult to engage them in coastal management. If community members consider the resources to be in good condition, yet scientific research shows they are deteriorating, then an awareness programme may need to be initiated to increase understanding of resource conditions.

By monitoring this information over time, the manager can see the impact management has had on people's attitudes and perceptions. For example, if the coastal management programme initiated an awareness campaign on the poor health of the coastal ecosystem, yet respondents continue to report good health, then this suggests that the programme has not been effective.

People's perceptions of the resource conditions are also useful for developing biophysical research and monitoring programmes. Community members, particularly people who directly use the resources, are often the most knowledgeable about resource conditions. This information can help guide a scientific agenda, particularly in areas where scientific data is lacking.

S17. PERCEIVED THREATS

What it is
Perceived threats measures what people think are the major threats to the coastal resources.

How to collect the data
Data on perceived threats are obtained by asking each respondent:

What are the top 5 major threats to the health of coastal resources?
1. _____;.2 _____; 3. _____; 4. _____; 5. _____

How to analyse the data
On the basis of the data from all the surveys, list the major threats. Calculate the percent of respondents who noted each threat as illustrated in this list and note in the *Survey Analysis Sheet* as follows.

Identified threats	**Percent noted this threat**
Sewage waste	53%
Over-fishing	30%
Anchor damage	26%

*Note that the responses do not add up to 100% because respondents may list up to five threats.

Additional analysis: Combine threats where appropriate. For example, if some people said "anchor damage" and others said "boating practices," then the "anchor damage" responses could be included under "boating practices" since they are a subset. Monitor these results over time to determine how perceived threats change.

Compare these results with the data from the Interview/Secondary Source data on *levels and types of impact (K23).* The threats listed above should also be listed as "high" in the *levels and types of impact* results. If there are significant differences, then consult with the key informants to determine the cause. If the difference cannot be explained, then it may be necessary to interview all the households to accurately determine perceived threats. It may be useful to describe what people perceive to be the major threats from both sets of data.

Compare these results with scientific studies of threats to resource conditions to determine the accuracy of people's understanding of threats.

How the information can be useful to managers and other stakeholders
Information on perceived threats is useful for identifying threats to the coastal resources. Community members, particularly people who directly use the resources, are often the most knowledgeable about threats to the resources. This information can help guide a scientific agenda, particularly in areas where scientific data is lacking, by identifying priority activities on which to focus.

By monitoring this information over time, the manager can see the impact management has had on coastal activities. For example, if the management programme prohibited fishing, yet people continue to perceive fishing as a threat, then this suggests that the programme has not been effective. Further scientific study should help determine if this is accurate.

Finally, this information is critical for developing awareness programmes and seeking stakeholder participation. If community members do not consider there to be impacts on the coastal resources, then it will be difficult to engage them in coastal management. If community members consider only one or two activities to be impacting the resources, yet scientific research shows there are several other impacts, then an awareness programme may need to be initiated to increase understanding of the full breadth of activities impacting the resources.

S18. AWARENESS OF RULES AND REGULATIONS

What it is
Awareness of rules and regulations measures people's knowledge that rules and regulations on coastal resources exist.

How to collect the data
Data on awareness of rules and regulations are obtained by asking each respondent:

Are there rules and regulations related to the following activities?: (develop list of activities to reflect *activities (K14*) (answer yes or no): fishing _____; mangrove use _____; aquaculture _____; hotel development _____; residential development _____; watersports _____; marine transportation _____

In order to determine awareness, the team must be aware itself of existing rules and regulations. This can be determined by asking the manager, or consulting the information collected in *formal tenure and rules (K32)* and *informal tenure and rules, customs and traditions (K33)*. Circle the resources that have rules and regulations for comparison with responses.

How to analyse the data
Calculate the percent of respondents who noted there were rules and regulations for each activity and note this in the *Survey Analysis Sheet*.

Additional analysis: Compare the percentages with those which were circled. The circled activities (those that have rules and regulations) should have high awareness compared to the other activities. Activities that have high awareness, yet are not regulated indicate misunderstandings by the public. Activities that are circled and have low awareness indicate the public does not realise there are rules and regulations on these activities. A short narrative may be prepared discussing the existing rules and regulations, compliance and enforcement drawing from the results of the next two variables.

How the information can be useful to managers and to other stakeholders
This information is critical for developing awareness programmes and seeking stakeholder participation. If community members are not even aware regulations and rules exist, it will difficult for them to abide by them. It will also be difficult to engage community members in coastal management. Understanding the community's level of understanding of rules and regulations is important for developing awareness programmes. Education is the foundation for compliance. It is therefore important for managers to identify which rules and regulations are unfamiliar to the community so that the awareness programme can target these rules and regulations. Monitoring the community's awareness of rules and regulations is therefore important for determining the impacts of coastal management on attitudes and perceptions.

S19. COMPLIANCE

What it is
Compliance measures to what extent people are perceived to be complying with regulations. Information about people's perception of the extent to which rules and regulations are complied with will be strongly tied to how much people know about rules and regulations in the first place.

How to collect the data
Data on compliance are obtained by asking each respondent:

On a scale of 1 to 5 (1=no compliance, 5=full compliance), to what extent do people comply with coastal management rules and regulations? _____

Additional Data: Respondents can be asked which activities or rules people are complying with or not complying with.

How to analyse the data
Calculate the percent of respondents for each scale of perceived compliance and note in the *Survey Analysis Sheet*.

Additional analysis: Some of the categories may be combined to simplify the interpretation. For example, if 23% of respondents said there is full compliance and 42% said there is some compliance, then these could be combined to say, "65% of respondents felt there is some to full compliance." This is easier to understand than listing the percentages for each category. Compare these results over time to determine if compliance is increasing, decreasing or staying the same. It may be useful to provide a short discussion on compliance, enforcement and the regulations and rules in existence from the previous and next variables.

How the information can be useful to managers and other stakeholders
Information on compliance is useful for understanding stakeholder participation and identifying coastal management problems. Lack of compliance is not only detrimental to the resources, but to gaining stakeholder support. If it is widely perceived that people are not complying with regulations, then it will be difficult to gain anyone's trust, support, participation or compliance.

By monitoring this information over time, the manager can see the impact management has had on people's attitudes and perceptions. If compliance begins to increase, then this should be reflected in people's perceptions of compliance. If this is not the case, then the manager may need to communicate the changes in compliance more effectively to the public (e.g. report decline in number of violations in park newsletter).

S20. ENFORCEMENT

What it is
Enforcement is measured by people's perceptions of the extent to which rules and regulations are enforced. This is similar to compliance, except compliance addresses people's behaviour (e.g. are people adhering to the rules). Enforcement addresses management activities, such as patrolling, imposing fines and confiscating illegal gear. Information about people's perception of the extent to which rules and regulations are enforced will be strongly tied to how much people know about rules and regulation in the first place.

How to collect the data
Data on enforcement are obtained by asking each respondent:

On a scale of 1 to 5 (1=no enforcement, 5=full enforcement), to what extent are the rules and regulations enforced? _____

Additional data collection: The respondents can be asked more specific questions concerning enforcement, such ask: "To what extent are the rules and regulations enforced for each coastal and marine activity?", "How often are violators caught breaking the rules?" and "What one thing can the management body do to improve enforcement?"

How to analyse the data
Calculate the percent of respondents for each scale of perceived enforcement and note them in the *Survey Analysis Sheet*.

Additional analysis: Some of the categories may be combined to simplify the interpretation as discussed for compliance. Compare these results over time to determine if enforcement is increasing, decreasing or staying the same. A short narrative may be prepared discussing enforcement, compliance and the regulations and rules in existence from the previous two variables. Compare changes in enforcement with changes in *stakeholder participation and satisfaction (K35)* and *participation in decision making (S21)* see whether the two are correlated.

How the information can be useful to managers and other stakeholders

Information on enforcement is important for understanding coastal management problems. Enforcement is one of the most visible aspects of management, and is therefore key to the communities' perception of management effectiveness. Lack of enforcement is not only detrimental to the resources, but to gaining stakeholder support. Similar to compliance, if it is widely perceived that regulations are not being enforced, then it will be difficult to gain anyone's trust, support, participation or compliance. Also, by monitoring this information over time, the manager can see the impact management has had on governance since enforcement is a key component. This will give stakeholders an opportunity to give feedback to managers on the perceived effectiveness of their management.

S21. PARTICIPATION IN DECISION MAKING

What it is

Participation in decision making measures how active resource users are in coastal management, particularly decision-making.

How to collect the data

Data on participation in coastal management are obtained by asking each respondent (resources users):

On a scale of 1 to 5 (1=no participation, 5=fully active participation), to what extent do you participate in coastal management:

decision-making? _____
monitoring?_____
awareness raising?
enforcement/surveillance? _____

On a scale of 1 to 3 (1=Low, 2=Medium, 3=High), to what extent are you satisfied with your level of participation in coastal management:

decision-making? _____
monitoring?_____
awareness raising?
enforcement/surveillance? _____

The list of management activities will have to be adapted to the activities prioritised by management (consult the management plan if it exists).

Additional data collection: Respondents can also be asked: "Can you participate in decision-making/coastal management activities?", and "What kind of participation would you like to see?" If not satisfied with their level of participation in coastal management it may be useful to ask respondents "why?" or "how can participation be improved?" These questions are asked to determine if respondents feel that they do actually have the opportunity to participate in decision-making and coastal management activities and how they would like to participate in the future.

How to analyse the data

Calculate the percent of respondents from the surveys for each scale of perceived participation and satisfaction and note in the *Survey Analysis Sheet* according to the management activity. Calculate for each level of participation and each activity identified, the percent of High, Medium and Low satisfaction (see the *Survey Analysis Sheet*).

Additional analysis: Compare these results over time to determine if participation and satisfaction are increasing, decreasing or staying the same. Compare these results with data on people's *perceptions of resource conditions and perceived threats (S16 & S17)* and *awareness of rules and regulations (S21)* to see if there is a correlation. For example, if people are not aware of rules and regulations and consider the resources with minimal threats, then they may not have an incentive to participate in management. A short discussion on participation and satisfaction, how it they have changed over time and how it is linked to people's perceptions may be provided.

How the information can be useful to managers and other stakeholders

By monitoring participation over time, the manager can see how effective the programme has been in engaging stakeholders in management, often an objective of management. Monitoring the level of satisfaction of the stakeholder with their level of involvement in the coastal and management process will also provide feed back on the satisfaction of stakeholders with the management programmes and the likelihood of their sustained support.

The level of stakeholder participation is useful to understanding the importance of the coastal resources to the public. The more people value the resources, the more likely they are to participate in management. There are other reasons as well, such as a crisis situation (e.g. oil spill), but generally the level of stakeholder participation can be used to demonstrate the importance of the resources.

Monitoring the level of participation and satisfaction with the participation will give stakeholders an opportunity to give feedback to managers on the management process to managers. It will help stakeholders help managers to target efforts on specific stakeholders.

S22. MEMBERSHIP IN STAKEHOLDER ORGANISATIONS/INSTITUTIONS

What it is

Membership in resource use stakeholder organisations refers to both formal and informal membership. The stakeholder organisations include direct users (e.g. fishers's cooperative, diving club) as well as people whose activities impact the resources (e.g. foresters association, hotel association), and people who do not use or impact the resources, but have a stake in management (e.g. environmental organisations).

How to collect the data

Data on membership in stakeholder organisations are obtained by asking each respondent:

Is anyone from your household a member of an organisation? _____
Which organisation(s)? _____

Additional data collection: The team may also ask about membership in civic organisations (e.g. church, youth organisations, women's groups) to gain an understanding of community participation in general.

How to analyse the data

Calculate the percent of respondents who are members of at least one organisation. Then list the noted organisations and calculate the percent of respondents who noted they were a member of each organisation. Note this information in the *Survey Analysis Sheet*.

Percent noted membership in at least one organisation: 82%

Noted organisations for membership	% respondents noted organisation
Fishers Cooperative	67%
Watersports Association	32%
Tourism Association	10%
Aquaculture Business Owners Group	25%

Additional analysis: Compare the results over time to see how membership shifts. Compare the membership percentages of the various stakeholder organisations to the *occupation (K12)* percentages to see if there is a correlation (e.g. if 90% of the community members are fishers, then is there an equally high membership percentage for the fishers's association). A short description of the membership may be provided, how it is related to occupational structure and how it has changed over time.

How the information can be useful to managers and other stakeholders

If the noted organisations are involved in coastal management, then membership can be a useful indicator of stakeholder participation in management. For example, if the fishers's association is responsible for closing certain areas to fishing, then a high membership indicates high participation in coastal management.

The comparison between membership and occupational structure is useful for determining if particular organisations have disproportionally high membership. The occupations employing the most people would be expected to have the highest levels of membership. Differences from this expectation may indicate that the issues an unexpectedly high-membership group deals with are of great importance, or the organisation is considered highly effective. If an occupation with small employment has a high level of membership it may be because people not employed in the occupation are interested in the occupation (e.g. as a community shifts out of fishing into tourism, people may continue to be members of the fishers's cooperative out of interest). It may be useful to talk with key informants to explain the results.

S23-25. PERCEIVED COASTAL MANAGEMENT PROBLEMS, PERCEIVED COASTAL MANAGEMENT SOLUTIONS, PERCEIVED COMMUNITY PROBLEMS

What it is

Perceived coastal management problems, perceived solutions and perceived community problems essentially assess what people think the problems are facing the community and coastal management and how to solve them.

How to collect the data

Data on these variables are obtained by asking each respondent:

Aside from threats, what do you see as the two major problems facing coastal management in the community?
1_____; 2_____

What do you see as solutions to these problems? 1_____; 2_____

What are the two major problems facing the community? 1_____; 2_____

Additional data collection: Respondents can be asked to explain the identified problems and solutions. They may also be asked what they see as solutions to community problems.

How to analyse the data

On the basis of the data from all the surveys, list the major problems facing the community. Calculate the percent of respondents who noted each problem. Group the problems into categories as appropriate, particularly specific problems. For example, if 4% of respondents noted conflicts between the fishers in community X and Y, and 12% noted conflicts between fishers in general, then these may be combined for simplicity. Note this information in the *Survey Analysis Sheet*.

Go through the same process for perceived coastal management solutions and perceived community problems.

Additional analysis: Compare the results over time to see how perceived concerns for management changes in the community. A description of people's perceptions of problems and solutions and how these have changed over time may be provided.

How the information can be useful to managers and other stakeholders

Information on people's perceptions of coastal management problems and solutions is particularly useful for understanding what people think needs to be addressed by the coastal managers, which may help managers identify management priorities. The information on community problems can help managers understand the larger issues facing the community (e.g. poor nutrition, lack of electricity) with which the management programme may or may not be able to assist. From the perspective of a manager's relationship with the community, perceived problems and solutions may be more important than the scientifically identified threats and solutions, as these are the communities' main concern and management must therefore be seen to addressing these issues, or should inform communities of the real issues if there is a big difference.

S26 & S27. SUCCESSES IN COASTAL MANAGEMENT, CHALLENGES IN COASTAL MANAGEMENT

What it is
Successes and challenges in coastal management assess what people think has and has not worked well for coastal management in the community.

How to collect the data
Data on successes and challenges in coastal management are obtained by asking each respondent:

What 2 things do you think have worked well for coastal management in the community? 1_____;. 2_____ _____

What 2 things do you think have not worked well for coastal management in the community? 1_____; 2____ _____

Additional data collection: Ask the respondent to explain each of their responses to the above questions.

How to analyse the data
On the basis of the data from all surveys, list the things that have worked well as noted by respondents. Calculate the percent of respondents who noted each thing. Group the things into categories as appropriate. Go through the same process for challenges in coastal management. Note this information in the *Survey Analysis Sheet*.

Additional analysis: Compare the results over time to see how successes and challenges have changed. Compare with *perceived coastal management problems* (S24) to check the results. A short description on how people view coastal management over time may be provided.

How the information can be useful to managers and other stakeholders
Information on successes and challenges in coastal management provides insight into the opportunities and solutions facing coastal management. It is also useful for understanding people's attitudes and perceptions regarding coastal management, and may help explain their willingness to participate in management. If the coastal management programme is perceived as having worked well, then people are more likely to want to work with the programme. This information can also be insightful for determining the effectiveness of the programme, or highlighting misconceptions about management that the manager can then address by explaining to the community in greater detail.

This gives an opportunity to the stakeholders to give feedback to managers on the management programmes, on its successes and failures.

S28. MATERIAL STYLE OF LIFE

What it is
Material style of life is an indicator of the relative social status of a community and is often used as an indicator of wealth. It can involve assessing house construction materials (e.g. roof, walls), household furnishings (e.g. rugs, seating), home electronics (e.g. satellite, TV, radio), and productive assets (e.g. boats, fishing gear).

How to collect the data
Data on material style of life are most easily collected by observation and interview. First it is important to interview key informants on what are wealth and poverty criteria. Which house construction materials, house furnishings, electronics and productive assets reflect wealth/poverty. Then at the household level the respondent is asked:

Do you own your own house? yes_____; no_____
Size of the house: number of rooms____

Then the following information is observed or asked:

type of roof: tile ____; tin____; wood___; thatch _____; grass____
type of outside structural walls: tiled ____; brick/concrete ____; stone; ___; mud; _____ thatch ____ grass____
windows: glass___; frame_____; open_____; none ____
floors: tile____; wooden ____; cement ____; mud_____
access to water: piped___; private well/borehole _____; public well____; river ___
power: mains_____; solar power ____; battery _____; none _____

This is a simplified list of house construction material. In some cases this list may need to be modified to more accurately reflect gradients of wealth within the study area. For example, in one area "mud" may be considered the poorest type of walls, in which case the list may need to be restructured to:

Walls: concrete finished____; concrete unfinished____; stone finished ____; stone and mud ____; mud ____

In other cases where house construction materials are meaningful as wealth or poverty criteria but most houses are made of similar materials, the condition of the materials may be a better way to differentiate different level of wealth. Then for each category of roofing material for example (tin, thatch) there would be a gradient of bad/good condition.

Accurate scale construction is needed to make meaningful comparisons between communities and over time.

To understand productive assets, the respondent is asked:

Do you own your boat? ____
How many boats do you own? _____
What is the boat made of (fiberglass or wood)? _____
How is the boat propelled (paddled, sailed or motorised)? _____

In some cases, housing may not be considered an important measure of social status by the community. In these cases, the team may want to focus on household and productive assets such as livestock, transport, and land. In some cases, the type of boats used may be a good indication of wealth.

Additional data collection: To learn more about the relative social status and wealth in the community, respondents may be asked about their ownership of other household assets. This list can include such items as television, radio, refrigerator, furniture, and other assets. They might also be asked about fishing gear ownership. Wealth ranking could also be used asking informants to rank stakeholder groups.

Of course the **assets or materials to be considered will depend on each site**, and the most appropriate ones will be identified by the team. The criteria can sometimes be reflected in other areas. Thus adding a question on the time to complete schooling makes sense.

How to analyse the data

Calculate the percent of houses that had each of the categories of house materials and note in the *Survey Analysis Sheet*.

How the information can be useful to managers and other stakeholders

Information on material style of life over time is useful to understand the economic status and relative wealth of communities and is especially useful in areas where it is difficult to obtain accurate income data. This is important to monitor to determine the impacts of management on livelihood over time. If the coastal management programme is having a positive impact, then the percentages on the resulting material style of life variables should shift toward the higher level items (e.g. from thatch to tin roofing). It is particularly useful in determining extent of equity of monetary benefits through the community. If the management programme has an equitable impact, then the team should observe a shift throughout the community and across all stakeholder groups, not just among a few individuals.

Improving knowledge on material style of life information and thus wealth will help stakeholders evaluate better their situation and the changes in time, and may be an indication of the effectiveness of management.

S 29. LEVELS OF POVERTY

What it is

Poverty has many dimensions and is defined in different ways in different cultures and contexts. Often poverty is defined as a condition in which people cannot satisfy what is regarded as a minimum standard of income, consumption or nutritional intake which are required to satisfy their basic needs of food, shelter and "well-being". Increasingly, other non-material aspects of poverty are also being recognised and poverty is increasingly defined as a "multi-dimensional" condition which "… has many faces, changing from place to place and across time, and has been described in many ways"[8]. In many coastal communities in South Asia, poverty is widespread, both in terms of "standard" measures of income, consumption levels or nutritional status and in wider terms of people's ability to make choices for themselves and their households, their relative influence over decisions that affect their lives or their capacity to bring about positive change in their livelihoods. In the context of SocMon within a community of coastal and marine resource users, all these aspects of poverty are important, and using "levels of poverty" as an indicator involves measuring **relative** poverty and well-being among different groups within the community both in terms of material well-being and capacity to exert influence over their environment (including their capacity to make choices regarding how they use the resources available to them).

How to collect the data

Where secondary data on poverty is available, it will generally provide data on groups above and below some form of "poverty line" used by administrators responsible for poverty alleviation or social protection programmes. This will tend to be based on asset-holdings, consumption and income levels and will not generally go into details regarding the poverty levels of different occupational groups, which may be of particular interest to coastal managers conducting SocMon.

A **Social** or **Wealth Mapping** exercise carried out with the community or with a group of key informants will enable those conducting SocMon to obtain a more detailed and comprehensive picture of relative poverty levels in different groups within the community and an understanding of the dimensions of poverty affecting resource users. It is particularly important when conducting such exercises to initiate it with a detailed discussion of what "poverty" or being "poor" means in the community in question and using this to establish a definition of different poverty levels which are meaningful for local people and the key informants involved. Standard measures of poverty may help in providing comparative data across sites but they will often mean little for people within the communities themselves. Box 3 below illustrates an example of Social/Wealth Mapping from India.

Box 3: Social mapping in Idinthakalpudur, Gulf of Mannar, India

In this example of Social/Wealth Mapping from the Gulf of Mannar, a study team used different coloured cards to represent the houses. The colours were used to denote the different types of houses, thus green cards indicated a thatched house, pink a tiled house and yellow a pucca house. The individual family details were generated on individual cards, using different types of shells, sticks, leaves, seeds, etc., placed on the cards to denote different key characteristics of the households, demographic features, occupation details and relative wealth/poverty.

Exercises like this are quite time-consuming but can provide a very high level of detail on the social and economic circumstances of different households in the community, helping SocMon operators to clearly understand the circumstances of different groups.

8 World Bank http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/0,,contentMDK:20153855~menuPK:373757~pagePK:148956~piPK:216618~theSitePK:336992,00.html

The collection of this data on poverty can be effectively combined with the collection of information on community level demographics (K1–K12) and household level data (S1–S14). Using a graphical map format for information can be particularly useful as it helps to clearly identify where different stakeholder groups are to be found and the location of particularly poor households who might otherwise be easily passed over or ignored in data collection activities and in discussions over changes in reef use. Wealth Mapping exercises can be combined with the collection of other demographic data and provide a high level of resolution for household level information.

How to analyse the data

Using the data from Social or Wealth Mapping exercises, a matrix can be developed, like the one below, to analyse the poverty levels of different resource-user groups. The criteria used along the top row of such a matrix will vary depending on the conditions of the community in question and the characteristics of poverty identified by local people during the exercise. Likewise the means of measurement of different criteria will be based on initial discussions of poverty with key informants and community members.

The level of detail obtained through this analysis may increase over time. For example, from the table below, during initial wealth mapping exercises a group defined as "open sea fishers" may, after further investigation and greater knowledge of the community, eventually be divided according to different scales of operation or different fishing methods used if this is seen to correspond to a distinction in the relative wealth levels of the households involved.

Occupational/ livelihood groups within the community (based on principle occupations / sources of livelihood)	**Typical combinations of household livelihood activities of these groups**	**Numbers of people/ households in these occupational groups**	**Characteristics of these occupational/ livelihood groups (gender/ age / H/H size / ethnic group/ etc.**	**Levels of dependence on coral reef resources**	**Poverty levels of this group**
1. Reef fishers	Diving on reef, reef gleaning, small-scale farming	120	Large families, mixed castes, long-term residents in area	+++++	Poor
2. Open sea fishers	Tuna/small-pelagics fishing, some farming, fish trading	230	Large families, dominant caste, long-term residents in area, women involved in fish trading.	+++	Medium / Wealthy
3. Mangrove fishers	Push-netting/ trap fishing in mangroves, wood cutting, labour in charcoal making, some small-scale farming	80	Mostly men, small families, low caste, many new migrants to area, young families	++	Very poor
4. Tourist operators	Tourist guides, guesthouse operation, restaurant/ small-scale vending, fish trading	50	Men & women, mostly new migrants to area	+++++	Medium / Wealthy
5. Farmers	Farming, trading, transport	50	Large families, dominant caste	+	Wealthy
6. Labouring	Building labour, open sea fishing labour, fish sorting, crab peeling, some reef & mangrove fishing	140	Many women & female heads of H/H, widows, young women	++	Very poor
7. Govt jobs	Government employment, small scale farming, some shop owners, some reef fishing	15	Men in paid employment, women working in paid employment and farming	+	Medium

Additional analysis: During subsequent updating of this information, new livelihood activities may be identified and changes in the numbers of people involved in different activities noted allowing SocMon investigators to identify changes in occupational patterns. These can be compared with changes in resource conditions, *types of use (K16), levels and types of impact (K23)* and *perceived threats (S17)* to see if there is a correlation.

How the information can be useful to managers and to other stakeholders

Poverty in South Asia is often "multi-dimensional". Coastal and marine resource user households may be poor because they have access to very limited assets and have only a limited set of livelihood options open to them. This in turn may be linked to the fact that they belong to a caste or tribal group with a very low status or because the head of the household is a widow. Poor coastal and marine resource-users may also be particularly reluctant to participate in community meetings, either because they are involved in illegal activities or often because they lack the confidence to participate in public meetings or think that they have little to contribute. As result they are often excluded from decision-making in their communities. Managers conducting SocMon need to be aware of the poverty levels of different coastal and marine resource user groups because this will strongly affect the ability of these groups to participate in decision-making about coastal and marine resource management and will also affect the extent to which they are willing to observe new management regulations regarding coastal and marine resource use – very poor users may simply not be able to **afford** to observe restrictions on their use of these resources because they have no livelihood alternatives open to them. Therefore helping poor coastal and marine resource users to identify and initiate alternative forms of livelihood activity **before** restrictions on access are introduced may be essential if management measures are to be successful.

The clear identification of poverty levels among different groups in the community will provide important indications for managers regarding those groups that require most attention in order to be brought "on-board" regarding coastal and marine resource management and protection. Working with poorer groups often requires patience, dedication and extra resources and managers will need to be aware from the beginning of which groups they need to focus on.

Where the SocMon process includes household level data collection exercises from a sample of households, the data collected during Wealth Mapping exercises can also provide a useful basis for deciding on sampling strategies and ensure that data collection covers households with different poverty, occupational and socioeconomic characteristics.

Regular updates of data on poverty levels through the SocMon process will also provide managers with indications regarding the impacts of management measures in terms of the livelihoods of people in local communities. Changes in the level and distribution of poverty within the community may provide important indications of successful implementation, the generation of benefits for local people or problems where exclusion from resource use is having appreciable negative impacts on certain user groups. The distribution of poverty within the community can be cross-checked with community demographic data to check on how particular age, ethnic or occupational groups may be being more or less affected by changes in resource use. Changes in these variables over time, and comparisons with *levels and types of impact (K23)* and resource conditions can indicate current or potential threats.

Data regarding the poverty levels of different user groups can also be compared with data on participation in decision making (S21) allowing managers to check on whether poor resource users are being included in decision-making processes regarding coastal and marine resource.

Discussions with community leaders and decision-making groups working with managers will also benefit considerably by being able to refer to data on poverty levels in the community and help to draw the attention of all concerned to the wider impacts, whether positive or negative, of coastal and marine resource management measures on people's livelihoods.

APPENDIX B: SECONDARY SOURCE/KEY INFORMANT AND FOCUS GROUP INTERVIEW GUIDE

COMMUNITY-LEVEL DEMOGRAPHICS

K1. Study Area: Base mape of the study area created with active participation of the key informants marking all the place (native) names for important geographical features and areas used. These names are often not found in an administrative map.

The socioeconomic monitoring team is expected to select and/or modify the interview questions based on their sites' needs. Gender disaggregation of data should to be carried out for all variables.

K2. Population: How many people live in the study area?_____ _____

K3. Number of Households: How many households are there in the study area_____

K4. Migration rate: What was the net increase or decrease in people moving into and out of the study area in the last year?_____ (note + or – to reflect moving in or out)

K5. Age: What percent of the people in the study area are currently in the following age categories?:

0-18____; 19-30_____; 31-50_____; over 50_____

K6. Gender/Sex Ratio: What percentage of the population is male or female?: male _____; female ___

K7. Education: What is the average number of years of education of people over

16 years old in the study area? _____

When respondents do not have an answer to a question, note the response as "don't know". Also consider whether there is another way to approach the question based on the local dynamics?

K8. Literacy: What percentage of the population is literate (can read and write local or state language)? _____

K9. Ethnicity/Caste/Tribe: What is the make-up of the study area (percent of each major ethnic/caste/tribal group in the study area)?: (write-in) _____; (write-in) ____; (write-in) _____

K10. Religion: What is the religious make-up of the study area (percent of each major religious group in the study area)?: (write-in) _____; (write-in) ____; (write-in) _____

K11. Language: What are the major languages spoken in the study area (percent of each major language in the study area)?: (write-in) _____; (write-in) _____; (write-in) _____

K12. Occupation: Complete the following table:

Major occupations in community	Percent of working population conducting this 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.				
2.				
3.				
4.				
5.				

COMMUNITY INFRASTRUCTURE, BUSINESS DEVELOPMENT AND OWNERSHIP

K13. Community Infrastructure, Business Development and Ownership:

Circle which services or businesses exist in the study area:

Services: schools, resident doctors, resident nurses, hospitals, functioning dispensaries, electricity, telephone, internet access, radios, televisions, newspapers, sewage treatment plant, ice plant, tarmac road access, water supply to homes, banking services, religious buildings (mosques, churches, temples), public distribution systems, ship, air, bus terminal

Businesses: private enterprise, food markets, restaurants, food stalls, petrol stations, banks, specialty shops, gift shops, dive shops, tour operations, fishing guides, guesthouses/hotels/inns/resorts, yacht charters

CBOs and availability of credit - Complete the following table

Business/	CBO type	Credit source	Formal/ Informal	Interest rate	Condition for access	Number of people/groups who access credit facilities
For e.g. fish vending	Individual	Money lender	Informal	24%	No condition and available anytime	35%
For e.g.	Self Help Group (SHG)	Bank	Formal	12%/year	Formation of SHG and minimum savings	20 -100%
Credit source: friends/family/ moneylender/bank/revolving funds CBO: individual /SHG/ company/cooperative/partnership						

COASTAL AND MARINE ACTIVITIES

K14-25. Activities, Goods and Services, Types of Use, Value of Goods and Services, Target Markets of Goods and Services, Traditional Knowledge, Use Patterns, Activity Location, Seasonality, Levels and Types of Impact, Level of Use by Outsiders, Household Use:

Complete the following tables (see *Appendix A, K14- 25* for examples of how to complete the table):

Coastal and marine activities	Coastal and marine goods and services	Types of uses (methods/ gear used)	Value of goods and services	Target markets	Traditional knowledge	Use patterns	Activity location	Seasonality	Level of impact	Type of impact	Level of use by outsiders	Household use

What occupational diversity exists in the local community? (Percentages) – Compile against/with *activities (K14)* for linkages to coastal and marine ecosystem use.

K26. Stakeholders: [List all stakeholders directly using the coastal and marine ecosystems]

Complete the following table:

Stakeholder	Activity	Where activity is conducted / season?		Gender and age category
*develop list according to activities identified in *activities (K14*)				

K27. Tourist Profile:

How many visitors are there total per year? _____

How many tourists visit from the following countries?:
(home country)_____; (write-in country)_____; (write-in country)_____;
(write-in country)_____; (write-in country)_____

How many tourists visit in the following months?:
January_____; February_____; March_____; April_____; May_____; June_____; July_____; August_____; September_____; October_____; November_____; December_____

How many tourists arrive by the following means of transportation?: air_____; cruise ship_____; other_____

What percent of the tourists are in the following age categories: 0-18 _____; 19-30_____; 31-50_____; over 50_____

What percent of the tourists are male or female? male _____ female_____

What percent of the tourists are interested in the following activities?:
nature _____; beaches _____; diving/snorkelling _____; fishing _____;
culture _____; other _____; other _____

GOVERNANCE, INSTITUTIONS AND DECISION MAKING BODIES

K28–32. Management Body/Model of Administration, Management Plan, Enabling Legislation, Management Resources, Formal Tenure and Rules:

Complete the following tables (see *Appendix A, K28-32* for examples of how to complete the table):

Coastal activity*	Management plan (Yes/No)	Enabling legislation (yes/No)	No of staff	Budget	Formal tenure and Rules (Yes/No)	Relevant rules and regulations (Yes/No)	Compliance formal and/or informal rules and regulation	
							Local	Migrants
Develop list based on activities identified in K14								

K33. Informal Tenure and Rules, Customs and Traditions:

Complete the following table

Coastal activity	Customs and traditions	Informal tenure arrangements	Informal rules	Level of compliance	
				Local	Migrants
Develop list based on activities identified in *activities (K14)* Elaborate on formal and customary rules and regulations if present in the local context/region					

K34. Community Incentives:

See Appendix A: (*K34)* for examples on how to fill the table below:

Stakeholder group	Benefit from provides to	Type of incentive

K35: Stakeholder Participation and Satisfaction:

See Appendix A *(K35)* for examples on how to fill the table below:

Stakeholder group*	**Decision making and management activities****	**Stakeholder participation (1 to 5)*****	**Level of satisfaction with participation (High, Medium, Low)**
*develop list according to stakeholder groups identified in *stakeholders (K26)* **develop list of management activities according to the *management plan (K29)* if it exists ***1=no participation, 5=fully active participation)			

K36: Community and Stakeholder Organisations:

Complete the following table:

Community Organisation	**Formal or informal**	**Main functions**	**Influence (on coastal management; community issues; both; other areas of influence)**

K37. Power and Influence:

List which organisations or individuals are involved in making decisions about your activities (i.e. where, when, how, and who can carry out this activity)?_____

Who (activity, age, gender) else (not necessarily part of an official process) **has** to be consulted for the activity to be carried out, expanded or changed?_____

Where do you get information from about marine and coastal resources (e.g. NGO, social group, news paper)?_____

APPENDIX C: SURVEY GUIDE

HOUSEHOLD DEMOGRAPHICS

When respondents do not have an answer to a question, note the response as "don't know".

The socioeconomic monitoring team is expected to select and/or modify the interview questions based on their sites' needs.

S1-8. Age/Sex Ratio, Gender, Education, Ethnicity/Caste/Tribe, Religion, Language, Occupation, Household Size:

Household members*	Age	Gender	Ethicity/ caste/ tribe	Education level completed (only ask if >16 yr)	Religion**	Ethnicity/ origin	Language (+foreign languages) (mother tongue and others)	Primary occupation	Secondary occupation
HH**									

*identify all living in house by name or role (e.g. grandmother)
** Information on religious affiliations may be too sensitive to ask at the household level. It may be more appropriate to get it at the community level by key informant or secondary sources.
HH: indicate who is the household head (e.g. mother) and if a woman whether she is a widow (w).

S9. Household Income Sources:

What is your household's most important source of income? _____

What is your household's second most important source of income? _____

COASTAL AND MARINE ACTIVITIES (HOUSEHOLD LEVEL)

S10–14: Household Activities, Household Goods and Services, Types of Use, Household Market Orientation, Household Uses:

(see Appendix A, S10-14 for examples of how to complete the table)

Coastal and marine activities	Coastal and Marine goods and services	Methods	Target markets	Household uses
1.				
2.				

3.				

ATTITUDES AND PERCEPTIONS, AND PARTICIPATION IN FORMAL/INFORMAL INSTITUTIONS

S15. Non-market and Non-use Values: (Be perceptive to local forms of awareness and use/non values- It is not necessary that science based or 'our' learnt knowledge should determine their values for use or awareness)

Indicate degree of agreement with the following statements using the scale: agree strongly (5); agree (4); neither agree nor disagree (3); disagree (2); disagree strongly (1).

_____ a) Coral reefs are important for protecting land from storm waves. (indirect non-market value)
_____ b) The Seagrass beds provide food to turtles and Dugong. (Indirect non market value)
_____ c) Reefs and lagoon provide us with beautiful fish and shells (indirect non market value)
_____ d) Mangroves are important as nursery grounds for sea animals (indirect non-market value)
_____ e) Coral reefs are important because they are beautiful (existence non use value)
_____ f) I want future generations to enjoy the mangroves and coral reefs. (bequest non-use value)
_____ g) Fishing should be restricted in certain areas even if no one ever fishes in those areas just to allow the fish and coral to grow. (existence value)
_____ h) We should restrict development in some coastal areas so that future generations will be able to have natural environments. (bequest value)

S16. Perceptions of Resource Conditions:

How would you describe current conditions of each of the following resources using the scale of very good (5), good (4), not good or bad (3), bad (2), to very bad (1) (edit list of resources to reflect site resources)?:

sand dunes____; mangroves ____; coral reefs ____; fresh water ____; upland forests _____; seagrass beds ___

fishing harbours/fish landing centres_____;

S17 Perceived Threats:

What are the top 5 major threats to the health of coastal resources?
.1 _____;2 _____; .3_____; 4 _____; .5_____

S18. Awareness of Rules and Regulations:

Are there rules and regulations related to the following activities (local, informal rules/customary and state instituted)?: (develop list of activities according to *activities (K14)*) (answer yes or no) :

fishing _____; mangrove use; _____; aquaculture _____; hotel development; _____; residential development _____; watersports _____; marine transportation _____

Give a brief explanation for Yes or No.

S19. Compliance:

On a scale of 1 to 5 (1=no compliance, 5=full compliance), to what extent do people comply with coastal management rules and regulations? _____

S20. Enforcement:

On a scale of 1 to 5 (1=no enforcement, 5=full enforcement), to what extent are the rules and regulations enforced? _____

S21. Participation in decision making:

On a scale of 1 to 5 (1 no compliance, 5 full compliance, to what extent do people comply with coastal management rules and regulations? _____

S 22. Membership in stakeholder organisations;

Is someone in your household a member of a stakeholder organisation? _____

Which organisation _____

S23. Perceived Coastal Management Problems:

Aside from threats, what do you see as the two major problems facing coastal management in the community?

1_____; 2 _____

S24 Percieved Coastal Management Solutions:

What do you see as solutions to these problems? 1_____; 2 _____

S25. Perceived Community Problems:

What are the three major problems facing the community?
_____; _____ ; . _____

S26. Successes in Coastal Management:

What 2 things do you think have worked well for coastal management in the community?
_____; _____

S27. Challenges in Coastal Management:

What 2 things do you think have not worked well for coastal management in the community?
_____; _____

S28. Material Style of Life:

Do you own your own house? yes_____; no_____
Size of the house: number of rooms____

For household materials:

Type of house: _____;_____;
Access to water: piped___; private well/borehole _____; public well____; river ___
Power: mains_____; solar power ____; battery _____; none _____

For productive assets:

Do you own your boat? _____
Number of boats owned? _____
What is the boat made of (fiberglass or wood)? _____
How is the boat propelled (paddled, sailed or motorised)? _____
What other gear do you own?
How many people work along with you as crew?

NOTE: this interview guide has to be adapted to the context, accurate scale construction is needed. Other types of information, such as *education (S3)*, may be appropriate to reflect household wealth (see *Appendix A: S29*).

S29. Levels of Poverty:

See *Appendix A S29* for example for how to complete this table.

Occupational/ livelihood groups within the community (based on principle occupations / sources of livelihood)	**Typical combinations of household livelihood activities of these groups**	**Numbers of people/ households in these occupational groups**	**Characteristics of these occupational/ livelihood groups (gender/ age / H/H size / ethnic group/ etc.)**	**Levels of dependence on coastal and marine resources**	**Poverty levels of this group**

APPENDIX D: KEY INFORMANT INTERVIEW/SECONDARY SOURCES ANALYSIS SHEET

Throughout the analysis it is important to reflect upon observations in the study area and to consider if these verify and/or contradict data from the interviews.

Use visual tools and matrices for representing spatial, time use, ranking and decision making data. Maps and diagrams drawn with community participation help analyse and validate data at the field.

When doing the calculations for a question, do not include "don't know" responses in the calculations. In other words, the calculation should only be based on the actual responses to the question.

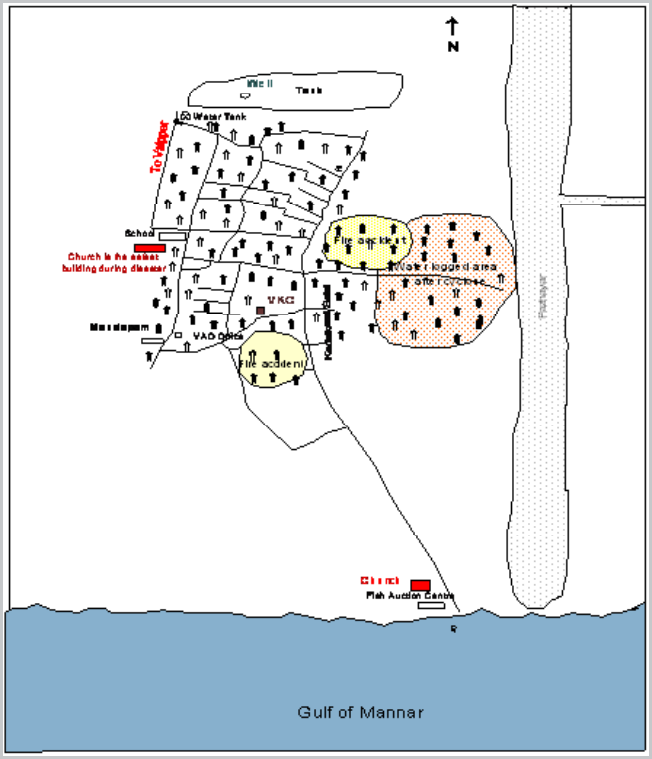
COMMUNITY LEVEL DEMOGRAPHICS

THE AREA

K1. Study Area:

Base map with resource, stakeholder and political boundaries of the study area. Carry out a participatory mapping exercise and prepare a base map showing important geographical features as noted by the community. Use native place names as far as possible since this will provide a common reference when an area is mentioned by name. This map will provide the base for all the other maps used in the analyses of different variables such as resource use activity. Refer to the case study in Section 1 for an example of a base map prepared by the community as part of SocMon exercise carried out at Agatti, Lakshadweep.

Additional analysis: Participatory GIS mapping – a GPS can be used to geo-reference and refine community maps (see Box 4). In addition to this, participatory seasonal mapping of the study area can be conducted by identifying seasonally varying information in a visual form. Bring out the main activities, problems and opportunities through the annual cycle, and show key linkages between components. The example in Box 5 shows how the team can prepare a seasonal diagram to represent cultural, occupational and climatic factors during different months of the year.



Box 4: Participatory GIS mapping

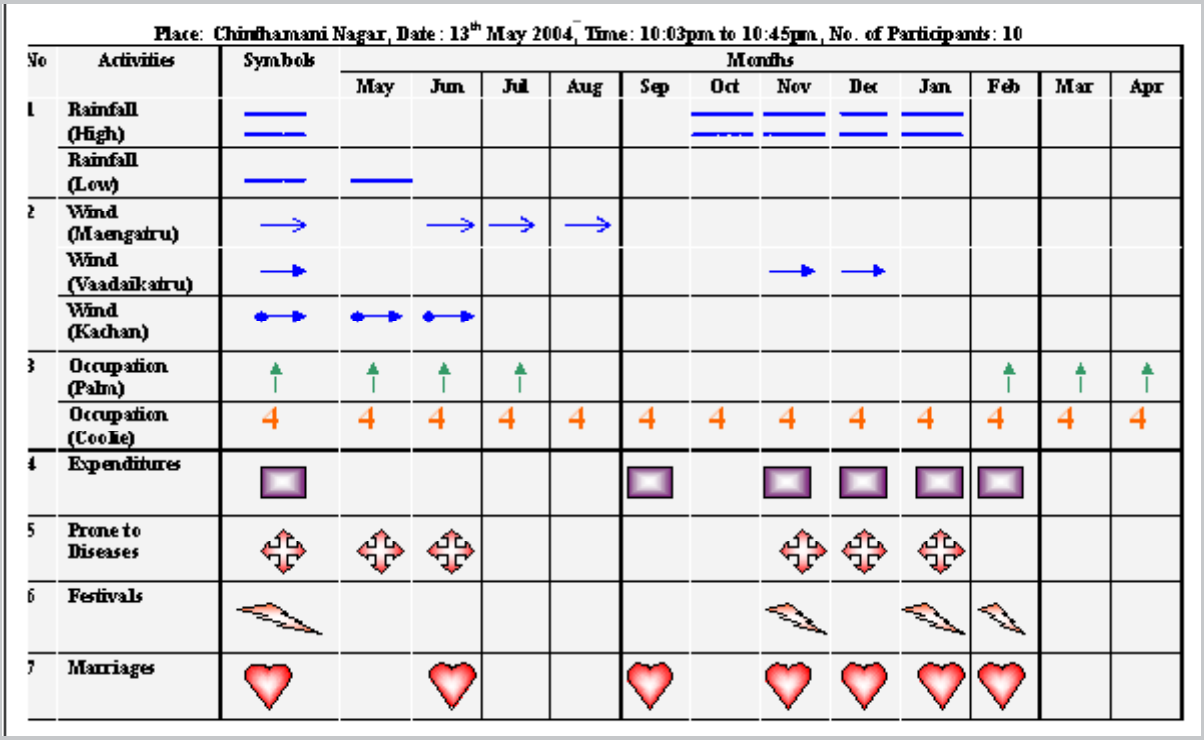
This geo-referenced base map was developed by Peoples Action for Development as part of a SocMon exercise in the Gulf of Mannar.

First the team created a digital street map with the key informants, marking important land marks.

The map was redrawn onto a large sheet of paper and presented to the community for verification. The community marked out the location of all the houses and made corrections to the map.

These data were put back into the digital map to create a complete profile of the study site that had been verified and created with the community.

Box 5: Seasonal calendar diagram developed for a community in Tamil Nadu, India



K2. Population: *Total population in study area:* _____

K3. Number of Households: Total number of households in study area: _____

K4. Migration Rate:

Net increase or decrease of people moving into or out of the study area over the last year: _____

(note + or – to reflect moving in or out)

K5. Age:

(see *Appendix A, K8* for an example of how to complete the table):

Percent of community age: 0-18_____; 19-30 _____; 31-50 _____; over 51_____

K6. Gender/Sex Ratio:

Percent of community: female _____; male _____

K7. Education:

Average number of years of education of >16 year olds: _____

K8. Literacy:

Percent of population that is literate: _____

K9: Ethnicity/Caste/Tribe:

Percent of population by ethnic make-up: (write-in e/c/t) _____; (write-in e/c/t) _____; (write-in e/c/t) _____; (write-in e/c/t) _____

K10. Religion: Percent of community by religion: (write-in religion) ____; (write-in religion) ____;

K11. Language: Percent of population by spoken language:
(write-in language) _____; (write-in language) _____

K12. Occupation:
(see *Appendix A, K12* for an example of how to complete the table)

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.				
2.				
3.				
4.				
5.				

COMMUNITY INFRASTRUCTURE, BUSINESS DEVELOPMENT AND OWNERSHIP

K13. Community Infrastructure, Business Development and Ownership:
Community infrastructure that exists in the study area:

_____ _____ _____
_____ _____ _____
_____ _____ _____
_____ _____ _____

Business development that exists in the study area and ownership
(see Appendix A *(K13)* on how to complete the table)

Business	Origin and place of residence of owners	Rank in order of frequency*

*The least numerous category is ranked 1.

CBO and availability of credit
Complete the following table

Business	CBO type	Credit source	Formal/ informal	Interest rate	Condition for credit access	Number of people/ groups who access credit facilities
Credit source: friends/family/ moneylender/bank, revolving funds CBO: individual /Self Help Group/ company/cooperative/partnership						

COASTAL AND MARINE ACTIVITIES

K14-25. Activities, Goods and Services,* Types of Use*, Value of Goods and Services, Target Markets of Goods and Services, Traditional Knowledge, Use Patterns, Activity Location, Seasonality Levels and Types of Impact, Level of Use by Outsiders, Household Use:

Complete the following tables (see *Appendix A, K14- 25* for examples of how to complete the tables):

Coastal and marine activities	Coastal and marine goods and services	Methods gear used	Value of goods and services	Target markets	Tradit-ional knowl-edge	Use patterns	Activity loca-tion	Seaso-nality	Level of impact	Type of impact	Level of use by outsiders	House-hold use

Use participatory mapping to represent these findings refer to *Appendix D, K1* and *Appendix A K19-22 i*n.

Coastal and marine activities	**Coastal and marine goods and service**	**Extractive & non extractive uses**	**Use patterns**		
			Location	**Timing**	**Season**

K26. Stakeholders: [List all stakeholders <u>directly</u> using coastal or marine resources]

Complete the following table:

Stakeholder	**Activity**	**Where activity is conducted / season?**		**Gender and age category**
*develop list according to activities identified in *activities (K14*) and activities observed				

K27. Tourist Profile:

Total number of visitors per year:_____

Number of tourists that visit from: (home country)_____; (write-in country)_____; (write-in country)_____; (write-in country)_____; (write-in country)_____;

Number of tourists that visit in: January_____; February_____; March_____; April_____; May_____; June_____; July_____; August_____; September_____; October_____; November_____; December_____

Number of tourists that arrive by: air_____; cruise ship_____; other_____

Percent of tourists that are age: 0-18 _____; 19-30_____; 31-50;_____; over 50_____

Percent of tourists that are: male _____; female_____

Percent of tourists interested in: nature _____; beaches _____; diving/snorkelling _____; fishing _____; culture _____; other _____; other _____

GOVERNANCE

K28–32. Management Body/Model of Administration, Management Plan, Enabling Legislation, Management Resources, Formal Tenure and Rules:

(see *Appendix A, K28-32* for examples of how to complete the table)

Coastal activity*	Management body(s) (Yes/No) & Name	Management plan (Yes/No)	Enabling legislation (Yes/No)	Number of staff	Budget	Formal tenure and rules (Yes/No)	Relevant rules and regulations (Yes/No)
*develop list according to activities identified in *activities (K14)*							

K33. Informal Tenure and Rules, Customs and Traditions:

Coastal activity*	Customs and traditions	Informal tenure arrangements	Informal rules	Level of compliance (High, Medium, Low)
*develop list according to activities identified in *activities (K14)*				

K34. Community Incentives

See Appendix A, *K34* for examples on how to fill the table below:

Stakeholder Group	Type of incentive

K35: Stakeholder Participation:

Stakeholder Group*	Decision making and management activities**	Stakeholder participation (1 to 5)***	Satisfaction with level of involvement (High, Medium, Low)

*develop list according to stakeholder groups identified in *stakeholders (K26)*
**Develop list of management activities according to the *management plan (K29)* if it exists
***1=no participation, 5=fully active participation

K36-K37. Community and Stakeholder Organisations, Power and Influence:

Community organisation	Formal or informal	Main functions	Influence (on coastal management; community issues; both; none)

Summary

Community organisation	Number	Percent	Main functions	Influence (on coastal management; community issues; both; none)
Formal				
Informal				
Total				

APPENDIX E: SURVEY ANALYSIS SHEET

HOUSEHOLD DEMOGRAPHICS

Throughout the analysis it is important to reflect upon observations in the study area and to consider if these verify or contradict data from the interviews.

When doing the calculations for a question, do not include "don't know" responses in the calculations. In other words, the calculation should only be based on the actual responses to the question.

S1-8. *Age/Sex Ratio, Gender, Education, Ethnicity/Caste/Tribe, Religion, Language, Occupation, Household Size*

Occupation

(see *Appendix A, S1-S8* for examples of how to complete the table)

Occupation (edit list of occupations according to responses)	**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**	
	A	(A/I) x 100%	Q	(Q/I) x 100%	(A+Q)/I x 100%
	B	(B/I) x 100%	R	(R/I) x 100%	(B+R)/I x 100%
	C	(C/I) x 100%	S	(S/I) x 100%	(C+S)/I x 100%
	D	(D/I) x 100%	T	(T/I) x 100%	(D+T)/I x 100%
	E	(E/I) x 100%	U	(U/I) x 100%	(E+U)/I x 100%
	F	(F/I) x 100%	V	(V/I) x 100%	(F+V)/I x 100%
Misc. (record together all occupations that were noted <5% of the household members)*	G	(G/I) x 100%	W	(W/I) x 100%	(G+W)/I x 100%
No occupation (e.g. students, retired, unemployed)	H	(H/I) x 100%	X	(X/I) x 100%	(H+Y)/I x 100%
TOTAL	I	100%	Y*	**	***

*not necessarily = I because not all respondents have secondary occupations
**not necessarily = 100% because not all respondents have secondary occupations
***greater than 100% because primary and secondary occupations combined

Occupation by Age and Education

(see *Appendix A, S1-8* for an example of how to complete the table)

	Percent responses						
Primary Occupation	**Age 0-15**	**Age 16-25**	**Age 26-45**	**Age over 45**	**< 6 years schooling**	**6-9 years schooling**	**>9 years schooling**

Occupation by Gender, and Religion

	Percent responses						
Primary Occupation	**Female**	**Male**	**ethnicity**	**Religion fill-in: _____**	**Religion fill-in: _____**	**Religion fill-in: _____**	**Religion fill-in: _____**

Occupation by Ethnicity/Caste/Tribe and Language

Primary Occupation	**Percent responses**					
	Ethnic/ caste/ tribal group fill-in: _____	**Ethnic/ caste/ tribal group fill-in: _____**	**Ethnic/ caste/ tribal group fill-in: _____**	**Language fill in _____**	**Language fill in _____**	**Language fill in _____**

Household Size

Average household size _____

Household size and structure by occupation

Primary occupation	Average household size	Average number of women per household	Average number of men per household	Percent of women headed households	Percent of widow headed households
Total/Overall					

S9. Household Income Sources

Occupation	Percent noted as primary source	Percent noted as secondary source

COASTAL AND MARINE ACTIVITIES

S10-12. Household Activities, Household Goods and Services, Types of Uses

(see *Appendix A, S10-14* for examples of how to complete the table)

Coastal and marine activities	Coastal and marine goods and services	Types of uses
1.		
2.		
3.		
4.		

S13. Household Market Orientation

(see *Appendix A, S13* for an example of how to complete the table)

Coastal and marine goods and services	% Noted international market	% Noted national market	% Noted regional market	% Noted local market

S14. Household Uses:

Coastal and marine goods and services	% Household consumption	% Sold	% Leisure

ATTITUDES AND PERCEPTIONS

S15. Non-market and Non-use Values:

	Percent Responses				
Value Statements	**1=disagree strongly**	**2 = dis-agree**	**3 = neither**	**4 = agree**	**5= agree strongly**
The reefs are important for protecting land from storm waves.					
In the long-run, fishing would be better if we cleared the coral					
The Seagrass beds provide food to turtles and Dugong					
Reefs and lagoon provide us with beautiful fish and shells					
Unless mangroves are protected we will not have any fish to catch.					
Coral reefs are only important if you fish or dive					

I want future generations to enjoy the mangroves and coral reefs.					
Fishing should be restricted in certain areas even if no one ever fishes in those areas to allow the fish and coral to grow					
We should restrict development in some coastal areas so that future generations will be able to have natural environments.					
Seagrass beds have no value to people.					

S16. Perceptions of Resource Conditions

(see *Appendix A, S16* for an example of how to complete the table)

Resources*	**Percent responses that describe resource conditions as:**				
	Very good (5)	**Good (4)**	**Neither good nor bad (3)**	**Bad (2)**	**Very bad (1)**
Mangroves					
Coral reefs					
Fresh water					
Upland forests					
Seagrass					
*edit list of resources to local site					

S17. Perceived Threats

(see *Appendix A, S17* for an example)

Identified threats Percent noted this threat

_____ _____

_____ _____

_____ _____

S18. Awareness of Rules and Regulations:

Percent of respondents who were awareness of rules and regulations related to (develop list of activities according to *activities (K14)*:

fishing _____

mangrove use _____

aquaculture_____

hotel development _____

residential development _____

watersports _____

marine transportation _____

S19-21. Compliance, Enforcement, Participation in Decision Making

Percent of respondents perceived each scale of compliance and enforcement with coastal management rules and regulations:

	Percent Responses				
	5 (full compliance/ enforcement/ participation)	**4**	**3**	**2**	**1 (no compliance/ enforcement/ participation)**
Compliance					
Enforcement					
Participation					

S22. Membership in Stakeholder Organisations/Institutions

(see *Appendix A, S22* for an example of how to complete the list)

Percent noted membership in at least one organisation: _____

Noted organisation for membership	Percent noted this organisation
_____	_____
_____	_____
_____	_____
_____	_____

S23. Perceived Coastal Management Problems

Major problems facing coastal management in the community	Percent noted this problem
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

S24. Perceived Coastal Management Solutions

Solutions to problems	Percent noted this solution
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

S25. Perceived Community Problems

Major problems facing community	Percent noted this problem
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

S26. Successes in Coastal Management

Things that have worked well for coastal management in the community	Percent noted these things
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

S27. Challenges in Coastal Management:

Things that have NOT worked well for coastal management in the community	Percent noted these things
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

MATERIAL STYLE OF LIFE

S28. Material Style of Life:

For household materials:

Percent of respondents that own houses: ____
Percent of houses that are owned by occupants:____
Percent of houses that have

tile roof____; tin____; wood___; thatch _____. grass____
have outside structural walls that are tiled ____; brick/concrete ____; stone___; mud ____; thatch____; grass_____
windows glass___; frame ____; open_____; none ____
floors : tile____; wooden ____; cement __; mud_____
Access to water: piped___; private well/borehole _____; public well____; river ___
Power: mains_____; solar power ____; battery _____; none _____
Average number of rooms:_____

For productive assets:

Percent of respondents that own 0 boats_____; 1 boat_____; 2 boats_____; more than 2 boats_____
Percent of boats made of: fiberglass _____; wood _____
Percent of boats that are propelled by: motorized _____; non-motorised _____

S29. Levels of Poverty

For levels of poverty

No/percent of people considered poor by the community _____
Description of relative wealth and poverty by the coastal community
Percent of people consider below poverty line by official sources_____
Description of poverty line as issued by official sources