

Socioeconomic Monitoring for Coastal Managers of South Asia: Field Trials and Baseline Surveys Kudawa, Vankalai & Silawathurai Villages, Sri Lanka

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Cover Photo: Fisher activity on the sea shore

Photo credit: Upali Mallikarachchi

Table of Contents

Executive Summary	6
Acknowledgements.....	7
Abbreviations and Acronyms.....	8
1. Introduction	9
1.1 Background to the project	9
1.2 Goals and Objectives	9
2. Monitoring terms and Methods.....	11
3. Study area	12
3.1 Kudawa GND	13
3.2 Silawathurai GND.....	13
3.3 Vankalai North GND	13
4. Village level demography and its characteristics	14
4.1 Number of house hold, population and gender.....	14
4.2 Population composition	14
4.3 Migration rate	15
4.4 Literacy and Education	15
4.5 Ethnicity/Cast and Tribe, Religion & Language	16
4.6 Occupation	17
5 Coastal and Marine Activities.....	18
5.1 Characteristics of coastal and marine activities	18
5.2 Levels and types of impact of coastal and marine activities.	20
5.3 Levels of use of marine and coastal resources by outsiders and the household.....	21
5.4 Stake holder's relationship with coastal resource management	22
5.5 Tourist profile	23
6. Governance.....	24
6.1 Management body	24
6.2 Management plan, enabling legislation and resources management	25
6.3 Formal tenure and rules	26
6.4 Informal tenure and rules, customs and traditions	27

6.5 Community incentives	27
7. House hold level demographic and characteristics.....	30
7.1 Household characteristics	30
7.2 House hold Income sources.....	30
7.3 Household Activities, market orientation and household use	30
7.4 Non-market / non use values.....	33
7.5 Perception of resources conditions	34
8. Attitudes and perceptions and participation in formal informal institutions.....	35
8.1 Perceived threats.....	35
8.2 Awareness of rules and regulations, Compliance, Enforcement.....	35
8.3 Participation in decision making.....	36
8.4 Membership in stake holders organisation.....	36
8.5 Perceived coastal management problems, coastal management solutions and community problems	37
8.6 Successes in coastal management and challengers in coastal management	37
9. Material style of life and poverty.....	38
9.1 Material style of life and facilities.....	38
9.2 Level of poverty	39
10. Conclusion and recommendation	41
References	43

List of Tables

Table 1 Monitoring Variables and Methods.....	11
Table 2 Total household, populations and sex ratio of Kudawa, Silawathurai and Vankalai north GNDs in 2011.....	14
Table 3 Age Composition in Kudawa, Silawathurai and Vankalai north GNDs.....	14
Table 4 Levels and types of impact by coastal and marine activities in Kudawa.....	20
Table 5 Levels of use of marine and coastal resources by outsiders and the household in Kudawa GND.....	21
Table 6 Stake holder relationships with marine activities in Kudawa GND.....	22
Table 7 Management bodies for coastal and marine resources in Kudawa.....	24
Table 8 Formal tenure and rules to manage costal and marine resources.....	26
Table 9 Stakeholder participation and their satisfaction for existing management measures.....	27

Table 10 CBOs and their functions in the Study Villages.....	29
Table 11 Diversity of livelihoods in Kudawa village.....	30
Table 12 Coastal and marine activity goods extracted & Market	31
Table 13 Percentage of people who target local, national and International markets.....	32
Table 14 Use of goods and services.....	33
Table 15 Non market/non use values and their ranking.....	34
Table 16 Perceptions of resources conditions.....	34
Table 17 Identified Threats-----	35
Table 18 Awareness of rules and regulations, Compliance, Enforcement.....	35
Table 19 Level of participation and satisfaction.....	36
Table 20 Membership in stake holders organization.....	36
Table 21 Perceived identified threats	37
Table 22 Success things in coastal management process.....	37
Table 23 Challengers in coastal management process.....	37
Table 24 Construction materials of houses of Kudawa.....	38
Table 25 Household facilities.....	39
Table 26 Level of poverty.....	39

List of Figures

Figure 1	Map showing study areas.....	12
Figure 2	Age wise categories of Population	14
Figure 3	Education levels in Kudawa GND.....	16
Figure 4	Occupation levels in Kudawa village.....	17
Figure 5	Marine Activities in Kudawa Village - Seasonal Calendar.....	18
Figure 6	Rainfall data from year 2000 to August 2011 in Kalpitiya SAM area.....	19
Figure 7	Salinity variation of Puttalam lagoon in 2011.....	19

List of Plates

Plate 1:	SocMon training programme.....	10
Plate 2:	Community leader Interview.....	17
Plate 3:	FGD at MCRCF office.....	29
Plate 4:	Moment of field investigation.....	32
Plate 5:	Vankalai North Fisheries Co-operative Society.....	36
Plate 6:	Community mapping.....	40

Executive Summary

Apart from the natural causes, human activities lead to considerable amount of damage to the coral reefs and other marine and coastal resources. A combination of unsustainable fishing practices, over fishing and lack of law enforcement and awareness on the importance and ecology of marine and coastal resources is being a constant threat. Therefore, it is important to consider a fresh approach to conserve and manage the marine and coastal resources, which could ensure the sustainability.

In compliance with the given TOR, the study was conducted in three fisheries villages; one in the North Western coastal region and the other two in the Northern coastal region. The selected sites are Kudawa located in the Puttalam district and Silavathurai and Vankalai located in the district of Mannar in Sri Lanka. The study sites were mainly selected based on the livelihoods and its relationship and interaction with the coral reef habitats.

In view of the above, the Socio-economic Monitoring and Assessment for coastal reef resources management at Kudawa, Vankalai and Silawaturai Fisheries Villages has been conducted to determine the status of resources and resource users. This study is expected to provide data on the latest situation concerning marine and coastal resources in Kudawa, Silavathurai and Vankalai both fisheries villages. Additionally, the study will help to identify suitable indicators to be used in future progress and have an impact on monitoring of the interventions.

The main objectives of the assessment are to;

- Provide a static picture of the well being levels of target households as well as the socioeconomic status of selected areas
- Identify sources of change in livelihoods and poverty at the sub-regional as well as household level.
- Prepare baseline information for monitoring & evaluation of impacts on marine goods and services

Data collection for the assessment was undertaken using several tools. These included, a desk study to gather all available information from secondary sources including past reports and publications, available at the national and district level. Furthermore, primary information were collected through focal group discussions and interviews carried out with key informants in all three sites. A survey was undertaken in Kudawa, Silavathurai and Vankalai fisheries villages to gather both quantitative as well as qualitative data.

The results of the survey are analyzed under the following main categories; Village level demographic and its characteristics, coastal and marine activities, governance, household level demographic and its characteristics, attitudes and perceptions and participation in formal informal institutions and material style of life and poverty.

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Abbreviations and Acronyms

ADB	Asian Development Bank
CBO	Community Base Organization
CCC	Community Coordinating Committee
CCD	Coast Conservation Department
CENARA	Capacity Enhancement of National Aquatic Resource Research and Development Agency
CORALI	Coral Reef And Livelihoods Initiative
CRMP	Coastal Resources Management Project
DFAR	Department of Fisheries and Aquatic Resources
DSD	Divisional Secretariat Division
DWLC	Department of Wild Life Conservation
FCS	Fisheries Co-operative Societies
GCRMN	Global Coral Reef Monitoring Network
GND	Grama Niladari Divisions
ICEDAI	Icelandic International Development Agency
MCRCF	Marine and Coastal Resources Conservation Foundation
MFAR	Ministry of Fisheries and Aquatic Resources Development
MFAR	Ministry of Fisheries and Aquatic Resources
NARA	National Aquatic Research and Resources Development Agency
NGO	Non Governmental Organization
NWP	North Western Provincial
SAM	Special Area Management
SocMon	Socioeconomic Monitoring

1. Introduction

1.1 Background to the project

Sri Lanka's coastline of about 1,620 km contains a diverse range of coastal habitats which includes sandy beaches, estuarine lagoons, sand dunes, salt marshes, mangroves and coral reefs and of course, the sea itself. These ecosystems not only provide beautiful scenic landscape but also produce large quantities of food and utility products. These areas are also important for tourism and recreation. Approximately 25 percent of Sri Lanka's population lives in the coastal region. The majority of them depend on coastal resources and are vulnerable to natural disasters such as cyclones, floods, coastal erosion, tidal waves and tsunami conditions. The socioeconomic conditions in coastal communities differ from region to region as well as from village to village. The Sri Lankan coastal communities are considered poor. Incomes are low and they have a limited access to educational facilities, health facilities, safe drinking water and basic sanitary facilities.

The coast of Sri Lanka and the resources in the coastal zone are therefore of great significance as many people from coastal communities depend on exploiting these resources for their livelihoods. One of the most important coastal resources is fish. About five percent of all people in Sri Lanka make a living by catching, selling or processing fish, crabs, prawns and lobsters. Another example of an important coastal resources use is tourism, which provides employment and income for many people.

At present, many coastal areas and the resources are under threat because they are often used in an unsustainable way. The unsustainable use of resources means that after a certain time, the amount and availability of the resources will decline or even completely disappears. The authorities who are trying to protect the environment and the resources in the coastal area cannot do so on their own. The local communities have an important role because they are the people who are using the resources which often results in degradation of the area. Therefore, they have to help to conserve the environment. In the end, it is usually the local communities who depend on their environment for their livelihoods.

1.2 Goals and Objectives

The long term goal; of the Socioeconomic Monitoring and Assessment for Coral Reef Management is to support management and development that can enhance the lives and livelihoods of local natural resource dependent coastal communities in South Asia.

The main objectives of the project are to;

1. Build capacity among key local stakeholders in conducting socioeconomic assessment;

2. Conduct socioeconomic baseline assessments at 4 target sites in India, Maldives and Sri Lanka using recently developed SocMon South Asia guidelines; and
3. Provide management and development advice by applying assessment results.



Plate 1: SocMon training

2. Monitoring terms and Methods

Three sites, Kudawa, Silawaturai and Vankalai fisheries villages in North Western and Northern Provinces of Sri Lanka have been selected in compliance with the Terms of Reference for the Socio-economic monitoring and assessment. The spatial boundaries of the sites have been determined are the same as Grama Niladari Divisions (GND). This is the smallest administrative unit of Sri Lanka. However, the livelihood activities and other linkages have been considered beyond these limits. To assess and validate the required socio-economic variables related to the communities and the resources, appropriate monitoring methods were selected from the SocMon guidelines and adopted where necessary as described in the following table.

Table 1: Monitoring Variables and Methods		
Variable/Parameter	Method Adopted	Remarks/Limitation confronted
1. Study area	Information collected through secondary sources Meeting with key informants	Limitation on spatial specific data
2. Village level demographic Characteristics	Collection of information through secondary sources Interviews Key informants	Limitation on spatial specific data
3. Household level demographic characteristics	Focused group discussions Interviews Key informants Observation	
4. Coastal and marine activities	Observation Key informants Records of fisheries offices	
5. Governance institutions and decision making bodies	Secondary data Participation in meetings and discussions Publications	
6. Material style of life	Observation Secondary information Interviews	
7. Attitudes and perceptions	Key informants By experiences Focused group discussions Participation in meetings and discussions	

3. Study area

Sri Lanka is an island located at the southern tip of India in the Bay of Bengal between $5^{\circ} 55'$ and $9^{\circ} 50'$ latitude and $79^{\circ} 42'$ and $81^{\circ} 52'$ longitudes. The total land area of the island is approximately 65,610 km² and its coastline extends to about 1585 km's with sandy beaches, extensive lagoons, estuaries, mangrove swamps, salt marshes, dunes and coral reefs (Baldwin, *ed.* 1991). In Sri Lanka the most extensive coral reefs are located in the Gulf of Mannar (Rajasooriya *et al.* 1995). These are situated offshore of Arippe, Silavathurai, Vankalai and Kalpitiya. The Bar reef is a part of this reef system located in the vicinity of Kalpitiya peninsular. To assess the socio-economic status, the following fisheries villages that have a close link with the coral reef system are being considered for this study (Figure 1).

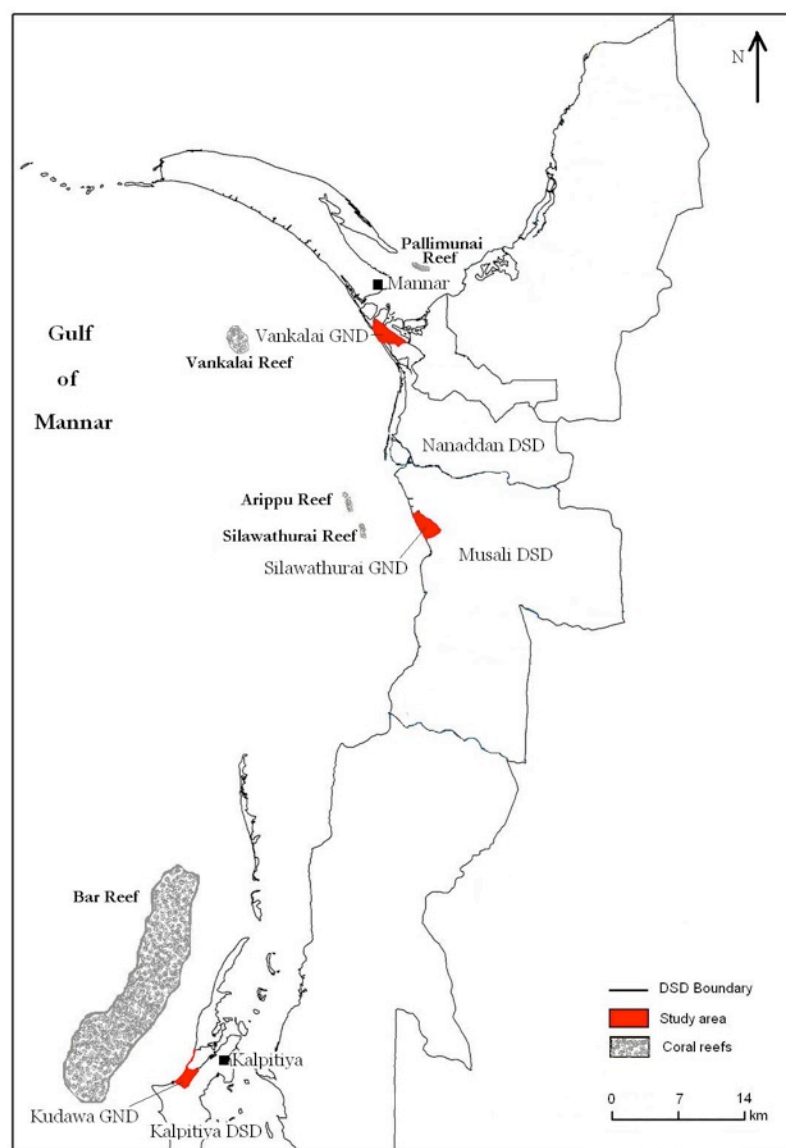


Figure 1: Map showing study areas

3.1 Kudawa GND

Kudawa GND located in Kalpitiya Divisional Secretariat Division (DSD) in the North Western Province of Sri Lanka. Kudawa GND is a coastal village which is situated along the upper western coastal segment of Kalpitiya peninsula bounded by the Sea and the Puttalam lagoon. The extensive reef system located between 2 and 8 kilometres away from the its shoreline and the surrounding environment contained a range of diverse ecosystems, including sandy beaches, lagoon, sand dunes, mangroves, sea grass beds and salt marshes. Fishing is the most important commercial activity in this area and is highly dependent on the diverse reef system. The total land area of the Kudawa GND is approximately 1.5 km².

3.2 Silawathurai GND

Silawathurai GND located in Musali DSD in Mannar district in the Northern province of Sri Lanka. Silawathurai coastal village is located along the lower west coast of Musali DSD in the southern boundary of the Mannar district. The total land area of Silawathurai is approximately 106 hectares. The extensive reef system is located about 4 kilometres away from the shoreline of Silawathurai. Fishing is the most important commercial activity in this area and is dependent on the diverse reef system. Prior to 2009, during the conflict situation in Srilanka around 50 families lived here. At present around 578 families have resettled so far in temporary and permanent dwellings. Majority of the community in the area, are Muslims. Twenty two Sinhala fisher families live in the area since 1980's for a period about 30 years. The Sinhalese fishermen migrated to Mannar from mainly from Negombo, Chilaw and Southern coastal segments.

3.3 Vankalai North GND

Vankalai north GND in Nanaddan DSD in Mannar district in the Northern Province of Sri Lanka. Vankalai north is a fishing village located along the upper coastal segment of Nanaddan DSD. The extensive reef system is located between 100 to 200 meters away from the shoreline of Vankalai north fishing village. The total land area of Vankalai fishery village is approximately 5 km². Fishing is the most important commercial activity in this area and is highly dependent on the diverse reef system.

St. Anthony's Fisheries society is in charge for all fishing activities. It is one of the largest fisheries societies in Mannar district. In 1990, most of the people residing in the area have migrated to India due to the conflict situation. Most of them returned and resettled in their native places in 1993. Presently 250 families resettled and some number of families still living in India. Data and information collection is rather difficult in the area due to resettlement and rehabilitation process is being carried out and de-mining activities taking place. Thus it is difficult to obtain accurate baseline data from any administrative institutions until the resettlement and rehabilitation process is completed.

4. Village level demography and its characteristics

4.1 Number of house hold, population and gender

The secondary data collected from administrative officers in the areas and the DSD, reveals that a total population of 613 people belonging to 165 households live in the Kudawa GND. The total population of Kudawa GND represent 326 females and 287 males respectively. The sex ratio of Kudawa GND indicates 47% males and 53% female. Silawathurai GND, has a total of 578 households, with a population of 2422 people of which 960 are females and 1462 males. According to available secondary information for Vankalai north GND, there are a total of 250 households in Vankalai North (GND) fisheries village with a population of 782.

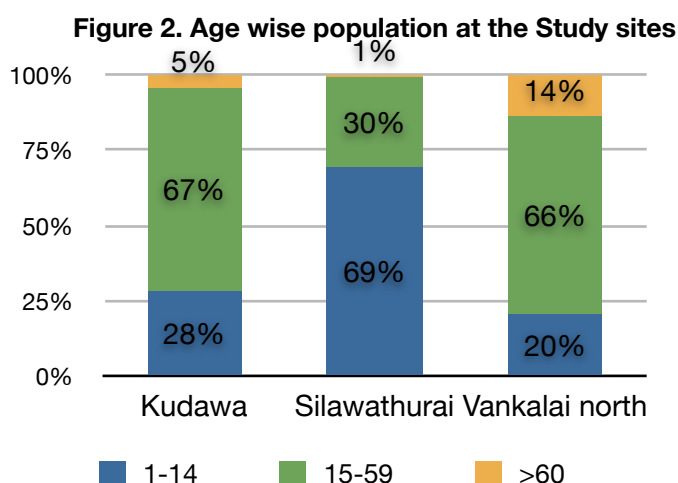
Table 2: Total household, populations and sex ratio of Kudawa, Silawathurai and Vankalai north GNDs in 2011				
GND	No. of Household	Total Population	Male	Female
Kudawa	165	613	287(47%)	326(53%)
Silawathurai	578	2422	1462(60.3%)	960 (39.6%)
Vankalai north	250	782	384 (49.1%)	398 (50.8%)

4.2 Population composition

Table 3: Age Composition in Kudawa, Silawathurai and Vankalai north GNDs			
Age Category	Kudawa	Silawathurai	Vankalai N
1-14 years	172	1681	160
15- 59 years	413	717	513
Over 60 years	28	24	109

percentage in Kudawa and vankalai but lower in Silwathurai. However under 14 years group and 15 – 59 years age group shows 3.49% and 5.5% difference respectively in Kudawa GN division. The available information, shows that the male population in two sites except Silavathurai site are lower than the female population. If this trend is continued, there will be negative impact on the fishing industry since male population plays an important role in active fishing.

The composition of the population according to the age categories in the Kudawa, Silawathurai and Vankalai north GNDs are shown in Table 3, and figure 2. The population data shows a low level of percentage of elderly people. This percentage is much lower than the national figures, which indicates higher percentage of 35.71 elderly people among the population. The female percentage is higher than the male



4.3 Migration rate

In Kudawa fisheries village there were no reports on migration except one team of beach seine operators with approximately 50 members. These beach seine operators originate from the eastern part of the country and settled in the area from August to end of April to engage in fishing activities. The reported normal migration is very negligible other than the seasonal migration during the fishing seasons. The fishers who are engaged in chank and seacucumber fishery migrate to the other areas in the North and the eastern part of the country. during the off season

Beside normal migration, specific form of migration are experienced in Kalpitiya peninsular in the recent past. Since early part of 1990, majority of moors have migrated to Kalpitiya peninsular from Mannar district due to conflict situation. However, soon after the conflict was over, most of the people have returned to their native locations in the Mannar district in mid 2009. Although most of the migrated people have returned to their native places in Mannar, some of their family members have permanently settled in the Kalpitiya peninsula. Hence the demographic characters in this region is being continuously changed.

According to the available information, there were about 50 families living in Silawathurai during the conflict period. At present, 578 families have been resettled in the fisheries village in temporary and permanent dwellings. Since resettlement and rehabilitation process is being carried out in the area and people are settling time to time, it is difficult to gather accurate data and information.

A Similar situation also exists in the Vankalai fisheries village. There is a lack of detailed data and information since transformation process is ongoing in Vankalai north. However, some composite data are available for 4 GN divisions namely Vankalai north, Vankalai south, Vankalai east and Thomaspuri. In 1990 many families migrated to India during the peak of the conflict and thereafter most of them returned and resettled in their native places in 1993. Presently 1500 families have resettled in the area and about 300 families are still living in India.

4.4 Literacy and Education

According to the information gathered, it was revealed that the level of education in Kudawa village is somewhat low. The figure 3 shows education level in Kudawa. It indicates that only 31% reach up to the ordinary level (O/L) but out of this only 4 percent have sat for the O. Level exam. It also indicates that only 1.8 percent qualify for the Advanced level examination. On the other hand there is no one reaching up to a diploma or Degree level of higher education. The important point is that 3.7% of children in the age of attending school are never attending school.

In comparison to Kudawa, the other two sites namely Silawathurai and Vankalai show a different picture concerning the education and literacy. According to the secondary and primary information collected from Silawathurai and Vankalai fishery villages, it was revealed that the level of education and literacy is much higher than the Kudawa village. According to the existing information, it shows that almost all the members of the fisher

communities in Silawathurai and Vankalai north reached at least secondary education. It is also found that that majority of fisher families in Vankalai north fishery village have at least one graduate for each family.

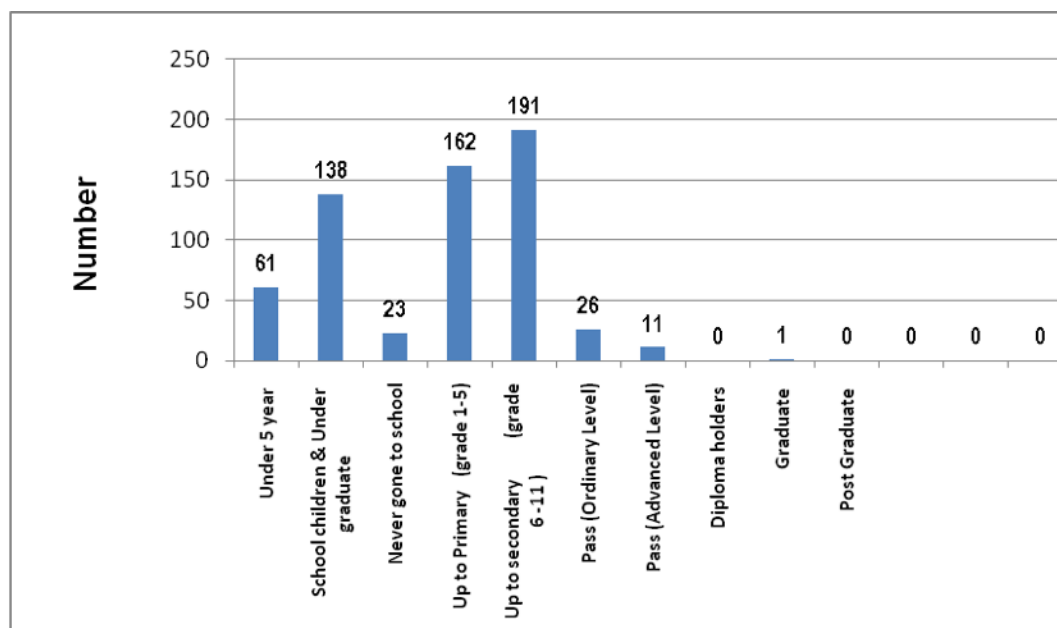


Figure 3: Education levels in Kudawa GND

However field level observations at Kudawa village revealed that almost all the people can at least read bus board either in Sinhala language or Tamil language. Further it was observed that the most of the male youngsters join their fathers and elder brothers for fishing during the school vacation and assist fishing activities. The professional experiences that they gained from their elder's leads to generate own income or pocket money for them. As a result of these direct financial incentives, the youngsters gradually tend to engage in fishing on full time basis. Thus, they are reluctant to attend schooling and rely increasingly on fishing or fishing related activities to earn sufficient income. Since there is lack of opportunities for girls in the fishing industry in Kudawa village, more girls are attending formal education than the boys. The lack of transport facilities act as one of the main impediments for schooling in Kudawa village.

4.5 Ethnicity/Cast and Tribe, Religion & Language

Ethnically only Sinhala community live in Kudawa village. 99 percent of them are catholic and one percent Buddhist. Although the majority of the community belongs to "Karawa" cast. The caste system is not very strongly functioning within the Kudawa community. Majority of them speak in Sinhala and some elderly speak both Sinhala and Tamil languages concurrently in their day to day activities.

In Silawathurai area 93 percent are Muslim, 5 percent are Tamil and 2 percent are Sinhalese. Religion wise Islam represents 93 percent of the fisher community and Catholics are 7 percent. Similar to Kudawa coastal village, the caste system is not very strong in the area. Majority of community members speak Tamil language and some of them can speak Sinhala and English languages.

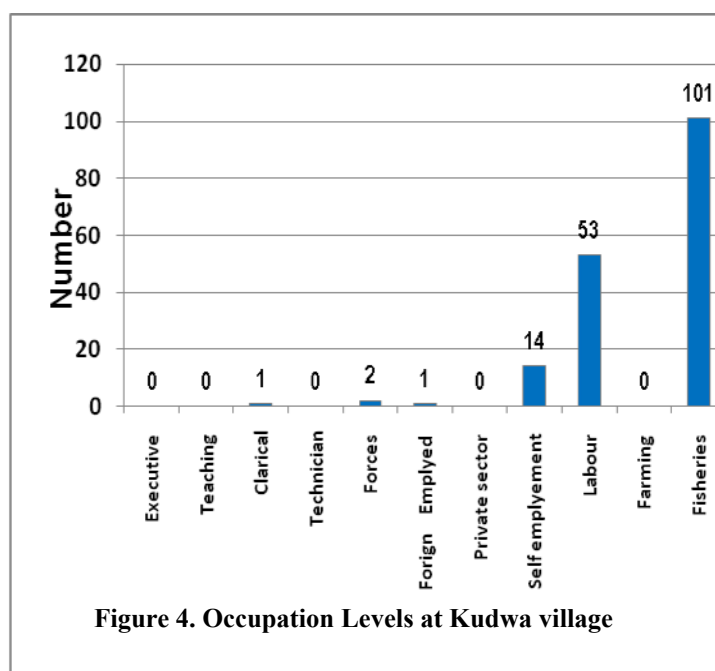
Ethnicity wise only Tamil community lives in Vankalai north GND and all of them are

catholic. Caste system is not strong within the community. Major language used by the community is Tamil and some of them can speak English and Sinhala languages.

It is also found that none of the Sri Lanka tribes or specific marginalized communities live in these three villages.

4.6 Occupation

Figure 3 shows the general structure of occupations in the Kudawa village. The information related to employment was collected from the GN officer and from the secondary sources. The fishery related data has been collected from the Fisheries Inspector and through fisheries cooperative societies.



The dominant livelihood activity in the area represent fisheries and fisheries related, self labour and other employments are followed. There are no people engaged in employments based on their educational qualification except for one clerical officer.

Similar to Kudawa village, major livelihood activity is fishing in both Silawathurai and Vankalai north areas. Public Sector employment, labour workers engaged in agriculture and small Scale entrepreneurs are other important livelihoods reported from both areas.



Plate 2: Community leader Interview

5 Coastal and Marine Activities

5.1 Characteristics of coastal and marine activities

The livelihood of Kudawa village depends on coastal and marine resources. Most of the community members in Kudawa villages engage in marine and lagoon fishery while the new generation are involved in diving for sea cucumber, lobster, chank and ornamental fish collection. The fisher community engage in fishing throughout the year but the level of catch vary and depend on the seasons. A great variety of fish and prawn catch is sold from Kudawa village for local consumption and to the national markets. The excess catch are sun dried during fair weather and sold to the dry fish traders. National and local level traders are involved in these activities.

Figure 7. Marine Activities in Kudawa Village - Seasonal Calendar												
Coastal & Marine activities	Calm season				Stormy season				Rainy season		Calm season	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fisheries	♂♂	♂♂	♂♂	♂♂	♂	♂	♂	♂	♂	♂	♂♂	♂♂
Fish trading	♂♂	♂♂	♂♂	♂♂	♂	♂	♂	♂	♂	♂	♂♂	♂♂
Fish processing	♂♀	♂♀	♂♀	♂♀							♂♀	♂♀
Suppliers	♂♂	♂♂	♂♂	♂♂	♂	♂	♂	♂	♂	♂	♂♂	♂♂
Tourism	♂♂♀	♂♂♀	♂♂♀	♂♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♂♀	♂♂♀
Water sports	♂	♂	♂	♂							♂	♂
Aquaculture	♂	♂	♂	♂	♂	♂	♂	♂	♂	♂	♂	♂
Agriculture	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀
Military bases	♂	♂	♂	♂	♂	♂	♂	♂	♂	♂	♂	♂
Conservation	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	♂♀

Collection, process and export of lobster, chank and sea cucumber from diving activities contributes to earning significant amount of foreign exchange. We also found that a small number of people provide auxiliary businesses for fishing related activities such as supply of fuel, salt and ice, etc.

With the declaration of tourism development area encompassing Kalpitiya and the surrounding environs, a significant amount of local and foreign tourists' influx was reported from the site. In this respect, Kalpitiya City centre as well as Kudawa village played a major role.

However, it is necessary to improve the infrastructure facilities such as accommodation, marine transportation, scuba diving and water sports facilities. In this respect, Kudawa village community were able to provide services for tourism related activities such as marine transportation, diving, and snorkelling,

Similarly, livelihoods of the communities in Silawathurai and Vankalai north fishing villages are entirely dependent on coastal and marine resources. Majority of community members in both villages engage in marine fishery, diving for sea cucumber, lobster, Chank and ornamental fish collections. People in Silawathurai and Vankalai north fishing villages engage in fishing throughout the year. However the type and quantity of catch

vary depending on the seasonality. Fish catch from both villages is sold for local consumption within Mannar district and to national markets. The excess catch is used for dry fish production in some seasons. Collections of lobster, Chank, sea cucumber and ornamental fish from diving activities directly sell for export purposes. A number of people are engaged in support activities for fishing such as supply of fuel, salt, ice, etc.

As per the seasonal calendar (Figure 5) prepared based on the primary information collected from the village, it was found that most of the marine activities take place during the calm season from November to April. The stormy season or the period of south west monsoon prevailed from May to August.

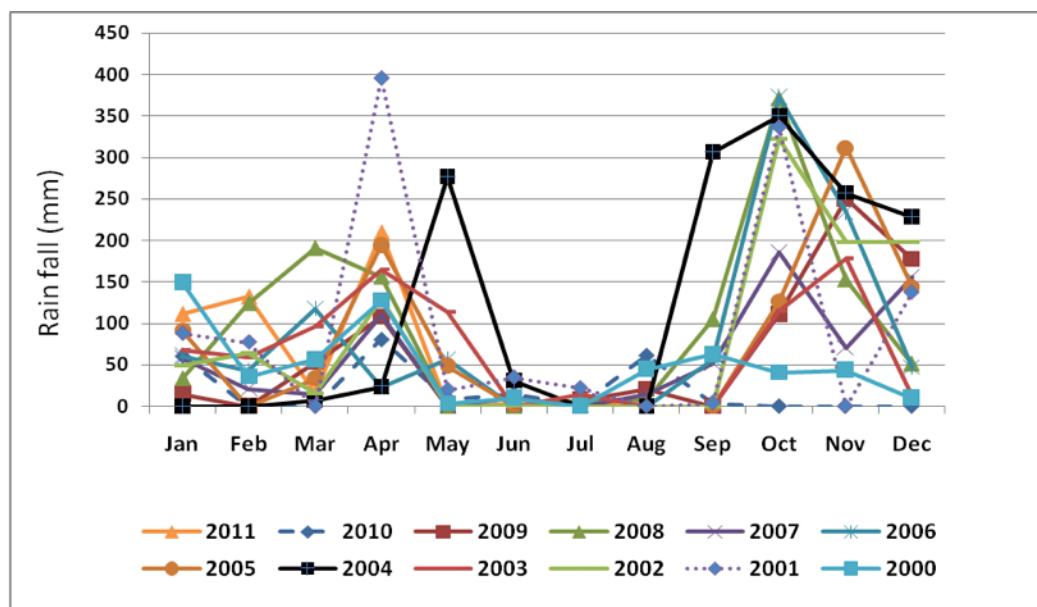


Figure 6 – Rainfall data from year 2000 to August 2011 in Kalpitiya SAM area.

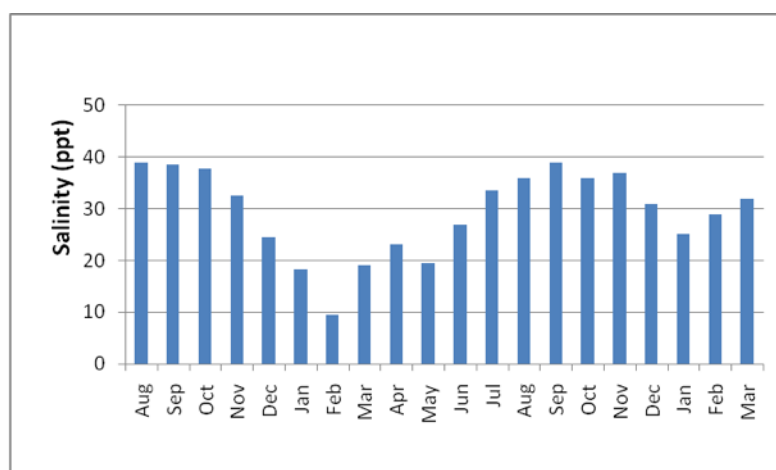


Figure 7: Salinity variation of Puttalam lagoon in 2011

The rainy season is experienced during the months of September and October. The information pertaining to annual rainfall and salinity in the lagoon in Kudawa village are given in Figure 6 and 7. The pattern of rainfall and the salinity levels in the lagoon have direct influence on the marine activities in the village.

Gender wise, males dominate the marine activities. The males are directly engaged in active fishing while females are engaged in post harvest fishery and households activities.

5.2 Levels and types of impact of coastal and marine activities.

Table 4 lists the economic activities in the villages and their effect on the coral reef ecosystem. These economic activities have adversely affected the coastal and marine resources especially in the Bar Reef ecosystem and the surrounding environment.

Table 4: Levels and types of impacts of coastal and marine activities in Kudawa GND				
Coastal & Marine activities	Good and services	Methods (primary)	Level of impact	Type of impact
Fisheries	Fish	nets	High	Over fishing
	Ornamental fish	nets	Medium	Over harvesting
	Prawn	nets	Low	Over harvesting
	Crab	Net/Trap	Medium	Over harvesting
	Lobster	diving/trap	High	Over harvesting
	Sea Cucumber	diving	High	Over harvesting
	Chank	diving	High	Over harvesting
Fish trading	Fish	Retail/ whole sale	Low	Competition
	dry fish	Retail/ whole sale	Low	Competition
	Sea cucumber	whole sale	Low	Competition
	Chank	whole sale	Low	Competition
Fish processing	Dry fish	Sun drying	Low	Pollution
	Sea cucumber	Boiling	Low	Pollution
Suppliers	Ice	Supply	Low	Pollution
	Fuel	Supply	Medium	pollution
Tourism	Hotels	Guest houses	Medium	Pollution
	House	rooms	Low	Pollution
	Marine transportation	OBM	Medium	Pollution
	Tour guides	Guide	Medium	Resources damage
	Transportation	vehicle	Medium	Pollution
Water sports	Diving	Scuba/ snorkeling	Medium	Resources damage
	Wind surfing	Surfing kits	Low	Resources damage
	Swimming	Beach	Low	Resources damage
Aquaculture	Milk fish	Pond culture	Low	Pollution
	Ornamental fish	tank culture	Low	Pollution
Agriculture	Coconut	Home garden	Low	Pollution
	<i>Aloe vera</i>	Home garden	Low	Pollution
Military bases	Navy	Security extension unit covers the coastline	Low	Anchor damage
Conservation	Awareness	Sign boards	Low	Visual pollution

Most of the negative effects have happened due to unsustainable fishing practices such as using purse-seine nets and placing fish traps on the reef. Over-harvesting sea

cucumber, chank, lobsters and ornamental fish. These are the most destructive fishing practices in the area. The pressure on the fish resources from the outsiders is not significant in comparison to the local extraction.

Tourism related activities are of recent origin and these add increasing pressure of the the reef system due to influx of outsiders for recreational purposes.

The recent increase of fuel prices in the global markets has lead to people concentrating fishing activities in the near shore areas. Thus the pressures on the near shore marine resources have significantly increased beyond sustainable levels.

Marine and coastal resources in the area are threatened due to tourism related activities. Although the Kalpitiya peninsular has been declared as a tourism development area, proper management structures have not yet been introduced to control and co-ordinate the tourism related activities. People have taken to the newly bloomed tourism sector activities without proper knowledge or training in the industry.

Similar to Kudawa, most of the negative impact on the resources have appeared in Silawatrai due to unsustainable fishing practices such as purse seine nets, over harvesting of sea cucumber, Chank, lobsters and ornamental fish by diving and laying fishing traps that lay on the reef etc.

5.3 Levels of use of marine and coastal resources by outsiders and the household

Household fish consumption is totally fulfilled from their own catch both from the lagoon and the sea in Kudawa, Silawathurai and Vankalai villages villages and most of the marine fisheries activities are for commercial purpose.

Table 5: Levels of use of marine and coastal resources by outsiders and the household in Kudawa GND				
Coastal & Marine activities	Good and services	Methods (primary)	Level of use by outsiders	Household use
Fisheries	Fish	nets	High	Sale, consumption
	Ornamental fish	nets	Low	Sale
	Prawn	nets	Medium	Sale, consumption
	Crab	Net/Trap	Medium	Sale
	Lobster	diving/trap	Low	Sale
	Sea Cucumber	diving	Low	Sale
	Chank	diving	Low	Sale
Fish trading	Fish	Retail/ whole sale	Medium	Sale
	dry fish	Retail/ whole sale	Medium	Sale
	Sea cucumber	whole sale	Low	Sale
	Chank	whole sale	Low	Sale
Fish processing	Dry fish	Sun drying	Medium	Sale
	Sea cucumber	Boiling	Low	Sale
Suppliers	Ice	Supply	Low	Sale
	Fuel	Supply	Low	Sale

Table 5: Levels of use of marine and coastal resources by outsiders and the household in Kudawa GND				
Tourism	Hotels	Guest houses	High	Sale
	House	rooms	Low	Sale
	Marine transportation	OBM	Low	Sale
	Tour guides	Guide	Medium	Sale
	Transportation	vehicle	Medium	Sale
Water sports	Diving	Scuba/ snorkeling	High	Sale
	Wind surfing	Surfing kits	High	Sale
	Swimming	Beach	High	Sale
Aquaculture	Milk fish	Pond culture	Low	Sale
	Ornamental fish	tank culture	Low	Sale
Agriculture	Coconut	Home garden	Low	Sale, consumption
	<i>Aloe vera</i>	Home garden	Low	Sale, consumption
Military bases	NAVY	Security extension unit covers the coastline	High	
Conservation	Awareness	Sing boards	High	

Unlike Kudawa GND, the influence on the marine and coastal resources from outsiders in Silawathurai and Vankalai are significant. Many outsiders are engaged in fishing activities in both Silawathurai and Vankalai north GNDs. Several fishermen who have migrated from Chilaw and Negombo area operate in Silawathurai. The fishers from Negombo and Chilaw are also engaged in Sea cucumber, Chank and lobster collection in Silawathurai and Vankalai fishery villages.

5.4 Stake holder's relationship with coastal resource management.

A stakeholder analysis focusing on the marine and coastal activities, was conducted during the survey. The primary and secondary stake holders were identified for each activity and given in the following table.

Table 6: Stake holder relationship with marine activities in Kudawa GND			
Coastal & Marine activities	Stakeholder -1	Stakeholder -2	Stakeholder -2
Fisheries	DFAR	FCS	Traders
Fish trading	Fishermen	Whole sale buyers	Bankers
Fish processing	Fishermen	Exporters	DFAR
Suppliers	Fishermen	Boat operators	Traders
Tourism	Boat operators	Accommodation suppliers	Hoteliers
Water sports	Boat operators	Accommodation suppliers	Tourists guides
Aquaculture	Fingerling suppliers	Whole sale buyers	
Agriculture	Buyers	Facilitators	
Military bases	Navy check point		
Conservation	MCRCF	DWLC	CCD

Fishers engaged in fishing, fish trading and related activities were identified as the main primary stake holder group in the Kudawa village. The other primary stake holders such as hoteliers, accommodation suppliers and boat owners are engaged in recreational and tourism activities in the area.

It was revealed that, a negative relationship has occurred between resource abusers such illegal fishing net operators and the other stake holders who are involved in conservation efforts and law enforcement. It also identified a strong positive relationship between fish traders and fishers. However mutual benefits have not been equally shared between them.

According to the stake holder analysis conducted in Silwatra and Vankal North villages, it was found that the primary stake holders are mainly related to the fishing activities and the people engaged in managing or conserving the resources. In this respect other than the fishermen, officials of the Department of Fisheries and Aquatic Resources, Department of Wild Life Conservation and Law enforcement have been identified as the primary stake holder groups.

5.5 Tourist profile

Recently, the Ministry of Economic Development has declared Kalpitiya as a tourism development area. In the past, there were no accommodation and supporting facilities available for the tourists. The nearest tourists hotel are situated 23 km away from Kudawa. In 2011, more local tourists visited Kudawa village for spending the day.

The main attraction of the tourist, university and school students and the locals are the coastal resources such as sandy beaches, coral reefs, dolphin and other cetaceans. Swimming, dolphin watching, snorkelling and diving were some of the recreational activities that took place in the Kudawa village and the adjoining environs. Foreign tourist stay in the local hotels and even visit from Negombo, and Colombo are keen to spend the day in Kudawa village and take part in the water sports offered.

Around five years ago, new hotels were constructed to target foreign tourists. A few of these hotels are still under construction. Therefore, there is no reliable data and information on the tourists arrivals in the area. At present, most of the visitors, especially local tourists stay in rented private houses for short period.

Currently, no tourism activities have been reported from Silawathurai or Vankalai area. However with the prevailing normalcy in the area, there is a potential for tourism development.

6. Governance

6.1 Management body

There are various management entities operating in Kudawa, Silawathurai and Vankalai to manage and control coastal and marine activities. However, the existing institutional mechanisms are unable to implement the enforcement, regulations and management measures effectively. The main reasons for the weak management is the scattered nature of authority, lack of resources, and the institutional capacities. In some instances, the responsible authorities failed to implement those management initiatives due unfavourable political interference's.

Table 7: Management bodies for coastal and marine resources in Kudawa				
Coastal & Marine activities	Management body	Enabling legislation	Number of staff	Budget
Fisheries	Yes -	Yes	1	N/A
Fish trading	Yes – Fisheries co-operation under the fisheries ministry	Yes	1	N/A
Fish processing	Yes - Department of Fisheries & Aquatic Resources	Yes	1	N/A
Suppliers	Yes – Local government authority	No		N/A
Tourism	Yes - Tourist board	Yes	4	N/A
Water sports	Non	No		N/A
Aquaculture	Yes- National Aquaculture Development Authority (NAQDA)	Yes	1	N/A
Agriculture	Non	No	1	N/A
Military bases	Yes – Sri Lanka Navy	Yes	3	N/A
Conservation	Yes – Dept. of wild life conservation, Coast conservation department.	Yes	3 3	N/A

In the fisheries sector in Kudawa village, operation of destructive fishing methods such as purse net (Lyla, Surukku), monofilament nets, diving for fishing and lobster trap are common in the area. Most of the fishing activities take place near the coral reef area of the marine sanctuary. Fisheries Department and the Department of Wildlife Conservation have the authority to control such activities, but they are unable to implement such enforcement effectively due to external pressures.

However the Coast Conservation Department (CCD) of the Ministry of Fisheries and Aquatic Resources Development (MFAR) has attempted to introduce participatory management mechanism through Coastal Resources Management Project (CRMP) funded by Asian Development Bank (ADB). This was implemented by adopting the concept of Special Area Management (SAM). The institutional mechanism was formed under the chairmanship of the Divisional Secretary Kalpitiya by means of establishing a functioning Community Co-ordinating Committee (CCC) with the representation of all relevant stake holders. However, the CCC became defunct after completion of the CRMP. Now the Fisheries Co-operative Societies (FCS) are eager to be involved in conservation activities based on the knowledge and the experience gained during the CRMP.

The Department of Fisheries and Aquatic Resources are mainly involved in managing the fisheries resources by means of implementing policies, regulations, and creating awareness among fishers. With the completion of the conflict situation in the Northern Province, the CCD has initiated coastal resources management interventions including implementation of Coast Conservation Act and its provisions. Prior 2009, almost all the marine activities have been controlled by Sri Lanka Navy since normal administration set-up was weak in Silawathurai and Vankalai north villages.

6.2 Management plan, enabling legislation and resources management

SAM has been declared under the CRMP to conserve Bar Reef ecosystem and its environment. SAM Plan also formulated to strengthen the participatory management process focusing Bar Reef ecosystem and the adjacent environs. The SAM area was demarcated comprising eleven GND in Kalpitiya DSD that have a close relationship and interaction with Bar Reef. Although there was no proper legal basis available to adopt the SAM process, it was implemented using administrative arrangements. However, with the introduction of New Coastal Resources Management and Coast Conservation Act (Amendments), required legal provisions have been put in place. Kudawa fisheries village is one of the key GN divisions in SAM area and located in proximity to the Bar Reef. In addition Bar Reef area was declared as a marine sanctuary in 1992 by the Department of Wild life Conservation (DWLC) in Sri Lanka. Therefore, the regulations imposed on the marine sanctuary have also influenced the marine and coastal activities of Kudawa people in Bar reef area.

There are more than 25 divers in Kudawa engaged in sea cucumber and Chank collection around Bar Reef area. To control these activities in NW coast of Sri Lanka, management a plan was prepared by NARA based on the resources assessment under CENARA project. The management guidelines formulated under this project are being implemented by DFAR to manage the resources.

In addition, Kudawa village plays an important role in the newly declared Kalpitiya tourism development area. However the laws to be introduced for tourism development activities in the area by North Western Provincial (NWP) Council still under way.

Besides the above, national level fisheries, tourism and environmental policies will

directly affect the livelihood activities of the people. The locally set up naval check points and security points also closely conduct surveillance and monitoring movements of fishing crafts and other marine activities. This process also indirectly helps the resources management process by curtailing unsustainable and illegal activities. Other key focal points involved in the management process in the area are the Divisional Secretariat, local government authority, Fisheries co-operative societies and the religious institution.

Since a long period of conflict situation prevailed in the Vankalai and Silawathurai there were no management plans for last 30 years. Civil administration was not established and, security forces controlled the overall activities. They still dominate the area. With the reconstruction and rehabilitation process being carried out in the area, some of the government and non-government organizations have emphasised on the need for management interventions.

6.3 Formal tenure and rules

Table 8 lists the coastal and marine activities and the availability of formal tenure and rules to manage coastal and marine resources. The majority of the coastal land within Kudawa and Vankalai villages belongs to individuals and they have the development rights and the ownership. In contrast the majority of the coastal land in Silawathurai belongs to the state. However, the development activities within the coastal zone are subject to approval of the Coast Conservation Department irrespective of the ownership. According to the Coast Conservation Act No.57 of 1981, the beach has been defined as a public property and no one can claim for its ownership.

Table 8: Formal tenure and rules to manage coastal and marine resources		
Coastal & Marine activities	Formal tenure and rules	Relevant rules and regulations
Fisheries	Yes	Yes
Fish trading	Yes	Yes
Fish processing	Yes	Yes
Suppliers	No	No
Tourism	Yes	No
Water sports	No	No
Aquaculture	Yes	Yes
Agriculture	No	No
Military bases	Yes	No
Conservation	Yes	Yes

The development activities such as sand mining, coral mining and construction along the coastal belt is controlled by the CCD through development permit system being implemented under the provisions of the Act.

In Kudawa village, coral mining activities other than some isolated incidents of sand mining for domestic purpose have not been reported. Killing of marine mammals and sea turtles have been controlled by wild life conservation act. The fishing activities in the lagoon and the coastal areas possess open access regime. However, to operate mechanised or non-mechanised fishing crafts for fishing, an operation licence has to be

obtained from the DFAR in compliance with the Fisheries and Aquatic Resources Act of 1996. The type of fishing gears, fish species, fishing season and fishing areas are controlled by the regulations made under the provisions of the Fisheries Act.

Besides the Coast Conservation Act and the Fisheries and Aquatic Resources Act, the marine activities are controlled by the Fauna and Flora protection ordinance as well as Forest ordinance.

6.4 Informal tenure and rules, customs and traditions

A range of informal tenure and rules customs and traditions are practised within the coastal fisheries sector in Sri Lanka. Most of these traditions, rules and informal tenure related to fishing activities are mainly unwritten laws or control measures that will ensure biological and economic sustainability of the resources. The latent functions that could be envisaged from these traditions and customs are much stronger than the formal rules and regulations. For example many Catholics and Muslims do not engage in fishing on Sundays and Fridays to maintain religious harmony in the villages. Similarly Buddhist also not engaged in fishing activities in Full moon days (Poya Days)

6.5 Community incentives

The SAM process has promoted public participation by adopting bottom –up collaborative planning process in Kudawa village. In this process, the stakeholder involvement and access to decision making process has been provided as an incentive. In addition, alternative income generating activities have been introduced as an incentive to reduce the pressure on the near shore marine and coastal resources. Similarly, micro credit programmes and a number of credit programmes have been implemented under various initiatives as incentives to promote livelihoods and build community resilience.

6.6 Stake holder participation and satisfaction

By and large the stake holder participation in marine and coastal resources management in Kudawa, Silawathurai and Vankalai is not very significant. However, in contrast, stake holder participation in marine and coastal resources management in Kudawa village is higher than the other two sites. This was mainly based on the opportunities available for them during the ADB CRMP, CENARA, ICEDA and the other interventions have been implemented by Community Based Organization (CBO)'s and Non Governmental Organization (NGO)'s

Table 9: Stake holder participation and their satisfaction for existing management measures			
Stakeholder group	Activity	Stakeholder participation	Level of satisfaction with participation
Fishers	Decision-making	4	H
	Monitoring	2	L
	Enforcement	2	L
Fish traders	Decision-making	2	L
	Monitoring	1	L

Table 9: Stake holder participation and their satisfaction for existing management measures			
Stakeholder group	Activity	Stakeholder participation	Level of satisfaction with participation
	Enforcement	1	L
Suppliers	Decision-making	1	L
	Monitoring	1	L
	Enforcement	1	L
Exporters	Decision-making	3	M
	Monitoring	2	L
	Enforcement	2	L
Boat operators	Decision-making	4	H
	Monitoring	3	M
	Enforcement	2	L
Accommodation Suppliers	Decision-making	2	L
	Monitoring	2	L
	Enforcement	2	L
Hoteliers	Decision-making	3	M
	Monitoring	2	L
	Enforcement	2	L
Tourists guides	Decision-making	2	L
	Monitoring	1	L
	Enforcement	1	L
DWLC	Decision-making	5	H
	Monitoring	3	M
	Enforcement	2	L
CCD	Decision-making	5	H
	Monitoring	3	M
	Enforcement	3	M
Navy	Decision-making	4	H
	Monitoring	3	M
	Enforcement	4	H
NGO	Decision-making	3	M
	Monitoring	3	M
	Enforcement	2	M

6.7 Community and stakeholder organisations

There are four community organizations in Kudawa. All four focus on community issues and their livelihoods. Two of them formal as Fisheries Co-op Societies and they are also concerned in coastal resources management. In overall view all four organizations are working with positive mind in resource management.

Table 10: CBOs and there functions in the study villages			
Community Organizations	Formal or informal	Main functions	Influence (on coastal management; community issues; both; none)
Kudawa village			
Semuthu Fisheries Coop. Society	Formal	Welfare, support to administrative activities	Both
St. Sebastian fisheries Coop. Society	Formal	Welfare, support to administrative activities	Both
Women Organizations	Informal	Welfare	On community issues
Scuba Divers Society	Informal	Welfare	Both
Silwathurai Village			
Muslim Fisheries Coop. Society - Chilawathurai	Formal	Welfare, support to administrative activities	Both
Tamil fisheries Coop. society - Savaripuram	Formal	Welfare, support to administrative activities	Both
Sinhala fsiheries society – Silawathurai	Informal	Welfare	On community issues
Vankalai Village			
St. Anthony's Fisheries Coop. Society – Vankalai north	Formal	Welfare, support to administrative activities	Both

6.8 Power and influence

The people of Kudawa always obey the priest of Kudawa church. A strong relationship can be seen between the people and the fisheries co-op societies. Fisheries co-op societies have power to make direct influence on marine and coastal activities. Money lenders and fish traders also can influence on the fishers who depend on them for credit. There are no other individuals or group that influence the activities of the villagers.

In both Silawathurai and Vankalai villages, people are always under the surveillance of the Sri Lanka Navy. Since Navy has to maintain law and order in the marine areas, they have direct influence on marine activities. Similar to Kudawa, there is a strong relationship between people and the fisheries co-operative society in Vankalai north fishing village. Money lenders and fish traders also can make influence to fishers who depend on them for financial requirements in both villages. A Few individual characters that have power in politics also influence the community.



Plate 3: FGD at MCRCF office

7. House hold level demographic and characteristics

7.1 Household characteristics

The average family size in Kudawa village is approximately 3.7 and its sex ratio of male and female respectively are 1.7, 2.0. The majority of the families in Kudawa village is headed by men and some instances a small number of households are headed by women. The dominant occupation of the household in the Kudawa village is fishing or fishing related activities. Young males are more interested in taking up income generating activities from their childhood rather than schooling. A higher percentage of young females continue their schooling at least up to ordinary level. Most of the female in Kudawa village are engaged in household activities such as cooking and caring their children and education. They are not engaged in income generating activities and their participation in decision making is somewhat low.

Almost 100% of Kudawa people are Sinhala Catholics. The caste systems are not functioning strongly in Kudawa village. Majority of the people speak in Sinhala and some elderly speak both Sinhala and Tamil.

7.2 House hold Income sources

The majority of the household in all three villages earn regular income from fishing and fishing related activities. Apart from fishing, agriculture is dominant among household in Silawatura village. Besides the main income sources, a small number of households in all three villages earn supplementary incomes from small scale enterprises. It is also found that few households earning income through family members employed in foreign employment. Apart from Kudawa village, households in Silawaturai and Vankalai north receive material or monitoring assistance through ongoing rehabilitation and reconstruction programme being implemented after completion of the conflict.

7.3 Household Activities, market orientation and household use

Table 11 lists the diversity of livelihoods in Kudava Village. Majority of people in all three villages are engaged in near shore fishing. Their usual fishing method is drift net fishing or gill net fishing. A few people use purse net as their main fishing gear. Purse net is

Occupation	Primary		Secondary		Total percentage of community members dependent on this occupation (primary and secondary)
	No. Of household members listed as primary occupation	Percentage of household members that listed as primary occupation	Number listed as secondary occupation	Percentage of household members that listed each occupation as secondary	
Fishermen	81	47	52	30	77
Divers	20	12	20	12	24
Day Labours	48	28	28	16	44
Masonry	5	3	5	3	6
Small business	11	6	3	2	8
Illicit liquor brewing	3	2	0		2
Government service	3	2	0		2
Total	172	100	108	63	163

totally band since it has been identified as a destructive fishing method. However these

gears are being used due to lack of proper enforcement and awareness. As can be seen from table 12, a major portion of the catch from the village is sales to the fish traders who deal with the national fish market. The remaining fish is used for household consumption. The same process also applicable to prawns too. Trap nets are used to catch crabs and lobsters. The target markets for crab and lobsters are national and export through local fish traders. The divers who collect Sea cucumber and chanks target only export market.

Table 12: Coastal and Marine Activities, goods extracted and Market			
Coastal & Marine activities	Good and services	Methods (primary)	Target Market
Fisheries	Fish	Nets	Local, National
	Prawn	Nets	Local, National
	Crab	Net/Trap	National, International
	Lobster	diving/trap	National, International
	Sea Cucumber	Diving	International
	Chank	Diving	International
Fish trading	Fish	Retail/ whole sale	Local, National
	dry fish	Retail/ whole sale	Local, National
	Sea cucumber	whole sale	International
	Chank	whole sale	International
Fish processing	Dry fish	Sun drying	National
	Sea cucumber	Boiling	International
Suppliers	Ice	Supply	Local
	Fuel	Supply	Local
Tourism	Hotels	Guest houses	National, International
	House	rooms	National, International
	Marine transportation	OBM	National, International
	Tour guides	Guide	National, International
	Transportation	Vehicle	Local, National, International
Water sports	Diving	Scuba/ snorkelling	National, International
	Wind surfing	Surfing kits	International
	Swimming	Beach	Local, National, International
Aquaculture	Ornamental fish	tank culture	Local
Agriculture	Coconut	Home garden	Local, National
	<i>Aloe vera</i>	Home garden	Local, National
NAVY	Maritime security	Security extension unit covers the coastline	Local
Conservation	Awareness	Sing boards	Local, National, International

Table 13: Percentage of people who target local, national and International markets				
Coastal & Marine activities	Coastal and marine goods and services	Percentage of persons noting international market	Percentage of persons noting national market	Percentage of persons noting local market
Fisheries	Fish	0	80	20
	Prawn	0	90	10
	Crab	80	15	5
	Lobster	95	5	0
	Sea Cucumber	100	0	0
	Chank	100	0	0
Fish trading	Fish	0	90	10
	dry fish	0	95	5
	Sea cucumber	100	0	0
	Chank	100	0	0
Fish processing	Dry fish	0	95	5
	Sea cucumber	100	0	0
Suppliers	Ice	0	0	100
	Fuel	0	0	100
Tourism	Hotels	40	60	0
	House	30	70	0
	Marine transportation	30	70	0
	Tour guides	30	70	0
	Transportation	20	70	10
Water sports	diving	60	40	0
	Wind surfing	100	0	0
	Swimming	20	40	40
Aquaculture	Ornamental fish	0	0	100
Agriculture	Coconut	0	40	60
	<i>Aloe vera</i>	0	80	20
NAVY	Security	0	0	100
Conservation	Awareness	10	60	30

As can be seen from table 13, eighty percent of the fish catch are targeted for national market through fish traders at the household level. Approximately 80 percent to 95 percent of the crabs and lobsters are taken for export market. The total amount of sea cucumber and Chank collection are target the export market.



Plate 4: Moment of field investigation

Table 14: Use of goods and services		
Coastal & Marine activities	Coastal and marine goods and services	Household uses
Fisheries	Fish	Sale, Own consumption
	Prawn	Sale, Own consumption
	Crab	Sale
	Lobster	Sale
	Sea Cucumber	Sale
	Chank	Sale
Fish trading	Fish	Sale
	dry fish	Sale
	Sea cucumber	Sale
	Chank	Sale
Fish processing	Dry fish	Sale, Own consumption
	Sea cucumber	Sale
Suppliers	Ice	Sale
	Fuel	Sale
Tourism	Hotels	Sale
	House	Sale
	Marine transportation	Sale
	Tour guides	Sale
	Transportation	Sale
Water sports	diving	Sale
	Wind surfing	Recreational activity
	Swimming	Recreational activity
Aquaculture	Ornamental fish	Sale
Agriculture	Coconut	Own consumption, Sale
	<i>Aloe vera</i>	Sale
NAVY	Security	Own
Conservation	Awareness	Own

7.4 Non-market / non use values

The overall perception of the people on the importance of coral reef is positive. They are well aware of that their livelihoods are linked and depend on the reef system. The community perception on the value of reef system is much higher in the Kudawa village than the other two villages. They have same perception on the mangrove and lagoon resources. They need to conserve and use those resources in a sustainable manner for the future generation. The people are well aware of that these resources also support to tourism activities. However the majority of the people do not have much knowledge on coastal process.

Statements mentioned in table 17 discussed with community randomly to test the knowledge on value of coastal and marine resource and using the scale of very good (5), good (4), not good or bad (3), bad (2), very bad (1) by person responds by 'Yes' or 'No'.

Table 15: Non market/non use Values and their ranking		
Non - Market values Statements	Answer	Rank
The reefs are important for protecting land from storm waves	Yes	4
In the long term, fishing would be better if we cleared the coral	No	5
Unless mangroves are protected we will not have any fish to catch	Yes	3
Coral reefs are only important if you fish or dive	No	4
I want future generation to enjoy the coral reef and mangroves	Yes	5
Fishing should be restricted in certain areas even if no one ever fishes in those areas, just to allow the fish and corals to grow	Yes	4
We should restrict development in some coastal areas so that future generations will be able to have natural environments	Yes	5
Sea and lagoon provide attraction to our village	Yes	5
Coral reefs are the main resources for tourism	Yes	4
Coral reefs are breeding ground for fishes	Yes	5
Allow to construct more tourist hotels in the beaches would be livelihood opportunities of people	No	3
You can sell the pieces of coral reefs to tourists	No	4
Sand mining causes to coastal erosion	Yes	5
Sea cucumber and Chank are unremitting resources	No	5

7.5 Perception of resources conditions

According to the people's responses, they are satisfied with the condition of sandy beaches and marine mammals in Kudawa. The people believe that the condition of coral reefs in the area is good but it is exposed to a precarious situation. According to their perception, the sand dunes and coastal vegetation are relatively in bad condition. The condition of the ground water table and the lagoon resources are in depleting state. They said that the ground water had become increasingly saline.

Table 16: Perceptions of resources conditions					
Coastal resources	Percentage of response describing resource conditions as				
	Very good (5)	Good (4)	Neither good nor bad (3)	Bad (2)	Very bad (1)
Coral reefs	5	20	60	10	5
Sand dunes	2	3	10	65	20
Mangroves	5	15	35	40	5
Coastal vegetation	5	10	15	60	15
Marine mammals	8	52	30	8	2
Lagoon	0	0	18	35	48
Sandy beaches	22	63	10	5	0
Ground water	0	0	3	56	41
Commercial fishes	0	3	33	52	12

8. Attitudes and perceptions and participation in formal informal institutions

8.1 Perceived threats

Table 17 lists the threats identified by the local community. Kudawa is seriously threatened by coastal erosion and increased salinity of ground water due to salt water intrusion since several years. This situation was perceived by the villagers as the main threats to coastal environment. They are also aware that the destructive fishing practices

Table 17. Identified Threats	
Identified Threats	%
Erosion	82
Ground water contaminant with salt	74
Destructive fishing practices	36
Tourism related activities	22
Mangrove and coastal vegetation clearing	16

(purse nets and crab and lobster trap on the reef) used by some fishers made a negative influence on marine environment. These fishing practices are identified as illegal fishing methods by authorities. However, the fishers use these destructive gears to earn quick money. They also identified that the tourism related activities posed

potential a threat to the environment. They indicated that some hotels had already start to dispose their waste on the coast line. Previously there were healthy mangrove and coastal vegetation along the Kudawa beach. Later on they cleared some patches of mangroves for beach seine operation and as a result the sand dunes have been disappeared. Therefore, people are well aware that the mangrove and coastal vegetation clearing create negative effect on the environment. Similar to Kudawa, people in both Silawathurai and Vankalai villages expressed that coastal erosion is the main environmental problem. They lost significant portion of land due to erosion taking place along the coastal belt. Depletion of drinking water is another major threat they confronted. Killing of marine mammals also takes place with high numbers in both villages. Destructive fishing practices also take place in Silawathurai and Vankalai north.

8.2 Awareness of rules and regulations, Compliance, Enforcement

According to table 18, majority of the people are aware of existing rules and regulations on fisheries. They also have knowledge on rules and regulation pertaining to security, resource conservation and fish trading. In the recent past, people were very concerned and keen to obtain knowledge on the rules and regulations related to tourism activities. People do not posses proper knowledge on water sport, aquaculture and

Table 18: Awareness of rules and regulations, Compliance, Enforcement				
Coastal & marine activities	Awareness on rules and regulations		Level of compliance	Level of enforcement
	Yes	No		
Fisheries	80	20	3	3
Fish trading	58	48	4	4
Fish processing	35	65	3	2
Suppliers	42	58	2	2
Tourism	30	70	3	3
Water sports	10	90	2	2
Aquaculture	10	90	2	2
Agriculture	28	72	2	2
Navy	65	35	5	4
Conservation	55	45	3	2

agriculture, because those activities are new and not very significant for their livelihood.

Level of compliance is relatively high in the areas of security and fisheries activities. Compliance level is less with the other activities due to lack of awareness, knowledge and proper enforcement.

8.3 Participation in decision making

As can be seen from table 19 the level of participation in coastal resource management and decision making is quite satisfactory due to awareness raising programmes conducted in Kudawa village. In contrast, the level of participation in Coastal Resource management in other two villages are not as significant. The reason for this is that CRMP activities have started only recently. Several government and non – government projects have implemented projects on resources conservation activities with the involvement of the local community.

Table 19: Level of participation and satisfaction in Kudwa village		
Participation measures	Level of participation	Level of satisfaction
Decision making	3	2
Monitoring	3	2
Awareness raising	4	3
Enforcement / surveillance	3	2



Plate 5: Vankalai North Fisheries Co-operative Society

8.4 Membership in stake holders organisation

Table 20 shows the stake holder organisations existing in the Kudawa fisheries village by the study team. Mainly the fisheries co-operative society plays a major role covering most of individuals of the village under them as members. The co-operative society also involved provides welfare programmes, micro credit and legal support such as preparing documents for fishermen for getting approval for fishing from relevant security authorities and DFAR in all the three villages. All fisheries societies definitely have a very strong membership otherwise the fishers may get into trouble with to the existing rules and regulations in the country.

Table 20: Membership in stake holders organisation	
Organization of membership	No. of members
Fisheries co-op society	350
Diving association	40
Fisheries women organization	50
Community water supply society	105
Tourists boat operators society	20

8.5 Perceived coastal management problems, coastal management solutions and community problems

Most of people state that coastal erosion is the main management issue as it is a threat to village structure, their properties and livelihood activities. For example Kudawa villagers have lost more than 5 acres of lands with houses in the recent past. As a remedial measure, they suggest to adopt engineering intervention and put up groynes and revetments to curb coastal erosion. People state that the ground water became saline due to salt water intrusion because of coastal erosion.

Table 21: Perceived identified threats	
Identified Threats	Percentage
Erosion	82
Ground water contaminant with salt	74
Destructive fishing practices	36
Tourism related activities	22
Mangrove and coastal vegetation clearing	16
Over fishing	21
Anchor damage	12
Coral and sand mining	11
Coastal protection structures	6
Waste disposal	2

8.6 Successes in coastal management and challengers in coastal management

Tables 22 and 23 show the success and challenges in the coastal management process listed by the local community. It was found that command and control management

Table 22. Success things in coastal management process		Table 23: Challenges in coastal management process	
Success Things for coastal management in community	%	Challenges for coastal management in community	%
Maintain transparency on policy making, implementation and enforcement	41	Biased	48
Avoid political interference	38	Political interferences	66
Provide alternatives	72	Misguides	18
Proper awareness	68	Custom and ethics	12
Flexibility	23	Addiction	36
Community participation	36	Dependence	32
Incentives	56	Poverty	60
Ownership	38	Uneducated	53
Unbiased	27	External influence	35
Respect to indigenous knowledge	18	Natural disaster	6
		Economic shocks	62

instruments are not very effective in achieving coastal resource management objectives. However the community expressed the effectiveness of public education and awareness

as well as direct development interventions in minimising issues related to the coastal resources management. They also indicated that they prefer hard solution such as construction of groynes and revetments to control erosion than the soft solutions such as controlling sand mining. The communities also indicated that the main challenge to coastal resource management was resource depletion and the exploring alternative livelihoods as the major challenge they confronted. They also listed community participation, enforcement of rules and regulations and monitoring as management challenges.

9. Material style of life and poverty

9.1 Material style of life and facilities

As can be seen from table 24 most of houses in Kudawa village are permanent in nature. The house roofs are either tiled or covered with galvanised iron sheets. The house walls are built with bricks and cement and the floor is cemented or tiled. A few houses are temporary constructions using plaited (Cadjan) coconut leaf for the roof and planks for walls and the floor is smoothened with cement.

Table 24: Construction materials of houses of Kudawa		
Part of Houses	Type of Material	%
Type of roof	Tile	65
	Asbestos Sheets	5
	Cajun thatch	30
Type of wall	Wood	15
	Cement	75
	Cajun thatch	10
Type of floor	Cement	88
	Tile	10

Most of the houses in Silawaturai area are temporary in nature with Cadajan and asbestos sheets. Housing projects are in progress under the resettlement programme and still not completed. Majority of the houses in Vankalai are permanent and most of them have a tiled roof, cement wall and cement and tiled floors.

As can be seen from table 25, eighty five percent of the dwellings possess proper sanitary facilities in their households. fifteen percent of the households do not have sanitary facilities and they use the nearest jungle or shrub areas as toilet. One water supply scheme has been established in Kudawa village for drinking purpose and most of households get private water supply connections from the scheme. There are several public water taps established for others only for drinking purpose. Almost all households have electricity supply to fulfil their power needs, but most of the households use firewood for their cooking purposes.

Temporary sanitary facilities can be seen in Silawathurai. People are still resettling here and living in temporary huts. Approximately 90% of the families have toilet facilities with water sealed. The remaining households use neighbour facilities in Vankalai north village.

Table 25: Household Facility		
	Type of facility	Percentage
Toilet	Water sealed	85
	Open pit	0
	No	15
Drinking water	Pipe	74
	Public pipe	6
	Public well	0
	Private well	10
	River (open water)	0
	Mineral bottled water	10
Power	Electricity	95
	Solar	0
	Firewood	5
	Kerosene	0

Drinking water is the main problem in both villages and its requirements are fulfilled from the neighbour villages. Almost all the households possess electricity and firewood also used for cooking purposes.

9.2 Level of poverty

Table 26 describes the occupational livelihood groups in the three villages and the levels of poverty that exist within the groups.

Table 26: Level of poverty					
Occupational livelihood groups within the community (based on principle occupations/sources of livelihood)	Typical combinations of household livelihood activities of these groups	Number of people/ households in these occupational groups	Characteristics of these occupational/livelihood groups (gender/age/ household size/ethnic group, etc.	Levels of dependence on coastal resources	Poverty levels of this group
Near shore fishing	Tuna, small-pelagic, prawn, crab, lobster	80	Resident in the area, large families, women involve in remove fish from nets	+++++	Medium, wealthy
Purse net operators	Small-pelagic, prawn	50	Young and strong people involve, residents in the area	+++++	Wealthy
Beach seine operators	Small-pelagic, prawn	02	Traditional group	+++++	Medium, wealthy
Lagoon fishing	Prawn, crab, small-pelagic	10	Low income families, Aged group	+++++	Poor
Diverse	Sea cucumber, chank, lobster	20	Skilled group, young and willingness people, Able to invest	+++++	Medium, wealthy
Tourist boat operators	Reef, marine mammals watching, diving	09	Able to invest, skill and young people	+++++	Medium, wealthy
Self employee	Fuel, ice supplies, retail shops, fish trading	06	Women, able to invest, aged	++	Medium, wealthy
Labours	Fishing labour, tourist boats assistants	75 members	Low income, skill men and women	+++	Poor
Government jobs	Clerical, forces	05	Comparatively educated men,	+	Medium

The coastal communities in Sri Lanka have been identified as poorest of the poor. However in relative terms the poverty levels in all three villages are different from each other. Since Kudawa village is located in a trouble free area, there were no restrictions or impediments in carrying out livelihood activities. Thus they have wider access to resources and facilities. Therefore poverty in Kudawa village is lower than the other two villages. They have basic amenities such as housing, water, electricity, energy and health facilities. In addition opportunities exist to fulfil the food requirements. However, their livelihoods are vulnerable due to seasonal variations and external economic shocks, in some instances it is difficult to fulfil their needs at once. Therefore they continue to depend on the internal social assistance by lending money or mortgage of their valuables.



Plate 6: Community mapping

10. Conclusion and recommendation

SOCMON South Asia provides a comprehensive guideline to carrying out socioeconomic monitoring in the Asian context. Often the settings in this region are very different from the developed world with poverty and livelihoods issues deeply intertwined with natural resources. Thus, it is very important that these resources are well managed to reap the benefits by the community, at the same time providing environmental conservation values.

Srilanka is a country whose economy is based on the pristine nature of its marine and coastal resources. From the livelihood studies of the three villages we can note that the livelihoods rely heavily on the marine goods and services and related industries such as fishing and tourism. Tourism which was absent in the bar reef area is now being thought of as the new economic driver. Thus the importance of appropriately managing the natural resources is crucial to the development of the local community.

As protected areas are used as a tool for managing natural resources it is applicable in the tourism and fisheries sector. If properly implemented they can aid in conflict resolution between stake holders who are using the same resources. The various participatory projects tried out in Bar reef need to be internalised and continuously used in management.

At present the coastal community is in need of more livelihood diversification and awareness. Clearly the efforts have helped in raising the awareness levels on issues of conservation and sustainable use in Kudwa village. These efforts should be replicated in Silwathura and Vankala and the other villages depending on the marine resources of the bar reef. Furthermore, development pressure is at a level that may still be managed and controlled in these areas.

The following recommendations are proposed as a result of this study

1. To establish a mechanism to curtail destructive fishing practices through proper enforcement in all three sites.
2. Strengthen institutional capacity of the related institutions on marine and coastal resources management by means of providing proper infrastructure in all three sites.
3. Demarcation of marine sanctuary and core area of the Bar Reef Kalpitiya.
4. Establish a reefs monitoring systems
5. Establish community surveillance systems to support authorities who engaged in resource management and law enforcement
6. Accelerate and implement by laws related to tourism development area in Kalpitiya focusing marine and coastal resources conservation.

7. Build up resilience against vulnerabilities among fisher community through diversification of livelihoods in all three sites.
8. Introduce technologies to produce value added dry fish products in household level in Vankalai and Silawathurai.
9. Provide incentives to avoid destructive fishing practices.
10. Form pressure groups to ensure implementation of rules and regulations on resources management.
11. Enhance opportunities and involvement of people in decision making and implementation forums.
12. Increase leaderships skill among community
13. Increase women involvement in resources conservation

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