Socio-economic Monitoring for Coastal Managers of South Asia: Field Trials and Baseline Surveys

Havelock and Neil Islands, Rani Jhansi Marine National Park, Andaman Islands

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Cover Photo: Boats on the sea shore along beach No: 5, Havelock Island

Photo credit: Manish Chandi

Preface

SocMon South Asia is designed for fieldworkers to use at regular intervals and learn with communities about their perceptions of changes taking place on coral reefs and among reef-dependent communities. It utilizes local knowledge cost effectively in identifying issues that may require more extensive action. Such as, detailed biophysical or socio-economic assessment, management intervention, awareness-raising or other guidance, and if regularly used, can serve to track changes over time. The activities also established a South Asia Node for the global GCRMN SocMon network, hosted at IUCN's Asia Regional Office.

However, the project within which SocMon South Asia was developed concluded in 2008, and while momentum was gained and a basic understanding of SocMon application instilled among partners, the recently completed guidelines are yet to be applied in the field. The proposed project thus seeks to conduct detailed field-testing of the SocMon South Asia guidelines, including site-based capacity building and baseline surveys.

The overall objective of the project is to support management and development which may enhance the lives and livelihoods of coastal communities in South Asia which are heavily dependent on local natural resources. Specifically, the project will:

1. Build capacity among key local stakeholders in conducting socio-economic assessment

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

The network of site-based practitioners across South Asia created by the efforts of GCRMN SA, CORDIO and, more recently, the CORALI project provides a strong implementation framework for the proposed activities. The CORALI project engaged with five sites over two years and facilitated close collaboration to develop SocMon South Asia guidelines with partners on the ground, thus creating a sense of ownership and commitment among them. Further, implementation of Sustainable Livelihood Enhancement and Diversification (SLED) activities were initiated at the same sites under the CORALI project. All these activities were underpinned by a thorough process that secured stakeholder involvement and built relationships with the communities as well as local/national policy and decision-makers. It is envisaged that SocMon can significantly support and complement this process, and vice versa.

The activities used in SocMon are guidelines to learn about communities in the vicinity of coral reefs that are dependent on marine resources. These can be modified to suit local contexts, thereby enhancing socio-economic managerial processes, strengthening capacity among committed organizations involved in associated activities, and generating information that can support management implementation and policy formulation.

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1. Executive Summary

Developing a socio-economic monitoring mechanism for the Rani Jhansi Marine National Park (RJMNP) in the Andaman Islands

Biodiversity conservation, resource management planning and particularly its implementation, while often constructed on comparatively sound ecological data and information, largely fail to sufficiently take into account the socio-economic processes and status of stakeholder communities. There is considerable local and national demand for data that can be used to support resource management and development goals using locally implementable methods such as SocMon (**Soc**io-economic **Mon**itoring of coral reefs), which require only minimal training and resources. There are many ground level constraints that are faced by most communities and managers in the South Asia region toward sustainable growth and conservation of natural resources. SocMon is a simple sociological field research and application tool/process that has been designed to build capacity in this regard through periodic data collection, sharing and visualization for the benefit of local communities, businesses and resource managers.

Socio-economic monitoring of coral reef usage with an emphasis on characterizing stakeholders was conducted under the aegis of SocMon in Havelock and Neil Islands of the Andaman Archipelago. These two islands are most frequented by tourists visiting the Andaman Islands. As is often the case, management guidelines and regulations are just being developed given the deleterious effects of growing and unregulated tourism maximizing economic opportunity on the reefs in particular. Over

the past seven years, Havelock Island in particular has seen a surge in visitation, leading to garbage disposal being increasingly seen as a problem. Despite being relatively pristine in its initial years, coral reefs adjacent and within the park have been subjected to various phenomenological changes both natural and human induced, that have changed the nature of those resources that cater especially to dive tourism and fisheries. This was exacerbated with El Niño events and storm surges leading to increased coral mortality, as well as inadequately addressed issues relating to garbage disposal and resource use, which are at present ongoing. The monitoring mechanism was designed to bring together relevant sources of information that may potentially be useful for managers and users of marine parks, from sources such as tourist resorts, dive shops, local islanders, administrative bodies and fishermen. Basic data from 3 dive shops, 200 households, 60 fishermen and others is presented as a profile of stakeholders who may benefit from, and will manage and influence, long term conservation of the park. This report explores a monitoring mechanism at this locale characterizing stakeholders, identifying avenues for regulation and highlighting ways to support local communities so they may continue to reap benefits from reef and beach-based tourism.

2. The Andaman Islands

The largest island archipelago system in the Bay of Bengal, the Andaman and Nicobar Islands cover a total area of over 8249 km², with a coastal stretch of 1962 km. Almost 86% of land area is covered with evergreen and tropical rainforests, and is now known to be a globally significant hotspot for biodiversity. The littoral and marine environments of the archipelago include nesting beaches for coral reefs, sea grass beds and four species of marine turtles. Significant mangrove ecosystems fringe bays and creeks of the archipelago while spectacular coral reefs and rocky shoal are spread underwater alongside most islands. Of the 306 islands, 94 are designated as Wildlife Sanctuaries, 6 as National Parks (2 of which are marine parks), and 5 as Tribal Reserves. Management of these wildlife parks and marine reserves are primarily with the Andaman & Nicobar Islands Forest Department, while agencies such as the Police Department, Indian Coast Guard and Navy also patrol and enforce regulations especially with regard to illegal poaching of marine resources.

3. Rani Jhansi Marine National Park (RJMNP): An introduction

The Rani Jhansi[1] Marine National Park was notified in 1996, with a view to conserve the terrestrial, marine and reef resources of Ritchie's Archipelago, of which many islands were formerly used for

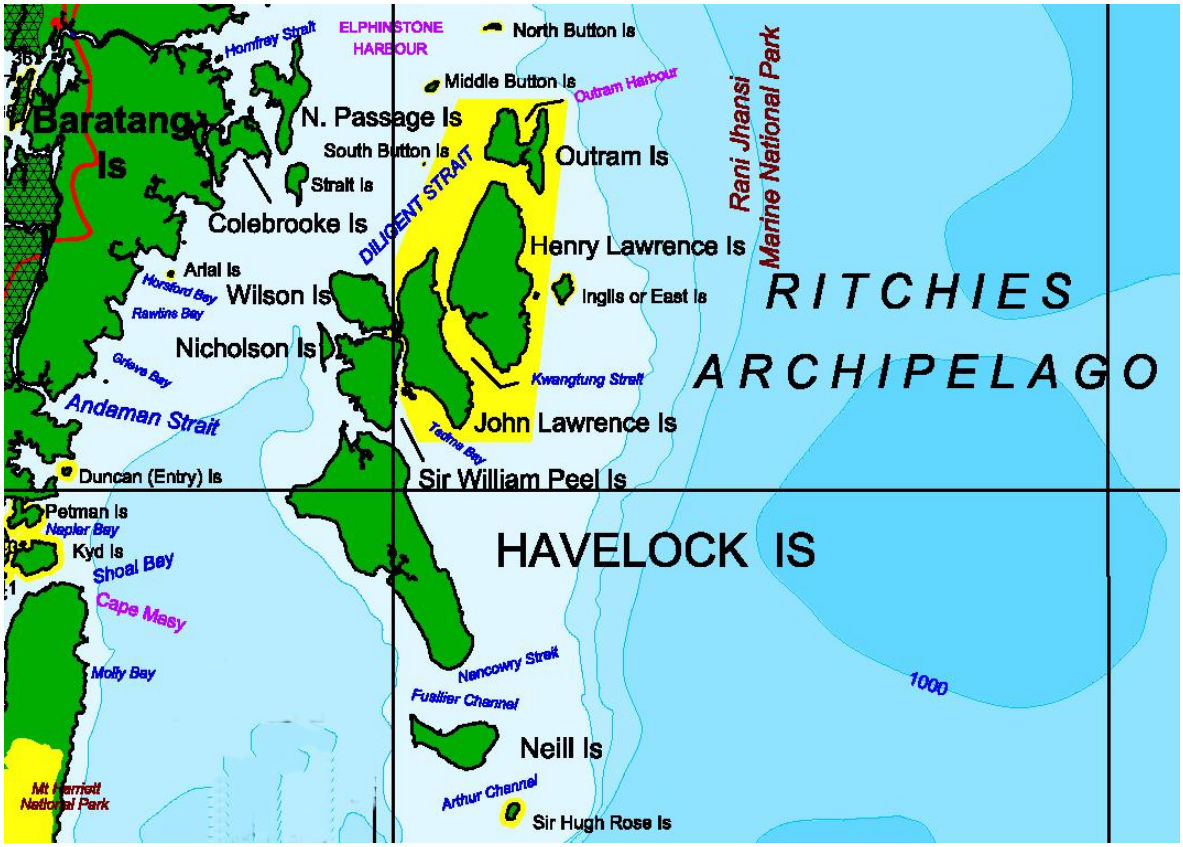
[1] Rani Laxmibai of Jhansi ('Jhansi'is a region in northern India in Bundelkhand region in the state of Uttar Pradesh) was a Queen who ruled Jhansi and its surroundings after the death of her husband, and fought the colonial British regime upto her death in 1858. She was symbol of resistance to the erstwhile colonial British East India Company rule in the sub-continent. British officers such as Sir Hugh Rose engaged in military warfare against the Rani. During the first Indian mutiny of 1857, other British officers of various regiments from Panjab and Uttar Pradesh led by the Lawrence brothers, Havelock, Outram, Inglis, Wilson, Nicholsonand Peel, considered heroes of the Indian mutiny, were engaged in suppressing the uprising, which led to the second colonization of the Andaman Islands and incarceration of political prisoners and others in the infamous Cellular jail at Port Blair. Given that the archipelago islands were named after these officers by the British during their colonial hold of the Andaman Islands, some strategists at New Delhi chose to name the newly designated Marine Park after the Rani of Jhansi.

forestry purposes. Havelock and Neil are the only inhabited regions of the archipelago, though kitchen middens found in sheltered coasts and mangrove regions across the islands contain archaeological remains of the indigenous Great Andamanese tribe of the *Aka-Balawa-da*, the original inhabitants of the region (Man 1878; Man 1885; UNESCO 2010). Sir Hugh Rose, Outram, Henry Lawrence, John Lawrence, East or Inglis Island, Peel, Wilson, Nicholson (heroes of the British who suppressed the Indian Mutiny (Cadell 1888), South Middle & North Button islands are uninhabited from the days of colonization, and were used initially for forestry while later

Photograph 1: Vista of the park from beach number 3, Havelock Island

conservation goals of the A&N Administration saw the creation of the RJMNP. Its original demarcation encompasses Outram, Henry & John Lawrence Islands, covering an area of 256.14 sq km; The Button series of Islands are categorized as the Buttons National park, which have recently been proposed (Anon 2005) to be included along with Peel, Wilson & Nicholson & East or Inglis Island along with the former demarcation of three islands as a consolidated archipelago of islands as the National park. This proposal when effected will include all uninhabited islands of Ritchie's Archipelago as part of the Marine National Park, with the exception of Sir Hugh Rose Island.

Forestry activities in the form of timber extraction and regeneration took place in the larger islands of this region until the creation of the National Park. Forest types represented in the islands include Andaman moist deciduous forests, littoral beach forests and mangroves. Fringing coral reefs largely composed of boulder and branching coral are found in near shore areas while ledges and banks are also used by dive operators and fisher folk as dive sites and fishing grounds along regions further within and along the ledge of the archipelago.



Map 1: Map of the Rani Jhansi Marine National Park and region of influence

Close to 25 dive sites have been identified by SCUBA dive shops of Havelock and Neil, nearly all of which are outside the National Park. Until recently one of the most frequented and famous dive sites was around South Button Island, which was apparently severely affected by a storm surge in 2010. Dive shops concede that increased visitation as well as anchor damage did occur to this particular site due to its popularity, but in the absence of governmental infrastructure, a consensus among dive operators resulted in the installation of locally constructed mooring devices to avoid anchor-related damage. The park remains a reservoir of biological diversity like most of the other protected areas in the Andamans, and is famous for its coral distribution and diversity, fish life, and butterfly diversity (Devy, Ganesh et al. 1998) in comparison to the Andaman's other MPA, the Mahatma Gandhi Marine National Park (MGMNP) off Wandoor. The need for protected areas and distribution of critically endangered species especially from this region is a matter of concern (Balachandra 1988; Pande, Kothari et al. 1991; Khatri 1993; Prashanth and Veenakumari 1996; Dagar and Singh 1999; Das and Dey 1999; Rao, Devi et al. 2000; Davidar, Yogananad et al. 2002; Andrews, Krishnan et al. 2006), and it is beyond doubt that the cooperation and participation of local communities and private enterprises are required to effectively manage these regions.

Photograph 2: Interlinked ecosystems on islands

4. A brief history

The islands of Havelock and Neil were settled in the post-independence phase of the reclamation and colonization of the Andaman Islands by the Government of India. Large settlements of refugees from Bangladesh were located on these islands and refugees were given cultivable land and basic residential facilities after lowland forests were cleared for use in the timber industry. Hilly land was also allocated for cultivation of cash crops and horticulture. Informal interviews with aged settlers on Havelock and Neil reveal that during the colonization phase, the availability of fish, timber, wild pigs and deer was plentiful; hardships encountered were an erratic ferry service, non-availability of electricity and shops with material goods, as well as the lack of education facilities for their children. Job opportunities were not a problem as the majority of settlers were cultivators who soon became known for the production of various vegetables marketed in Port Blair. A small community of fisher folk originating from Andhra Pradesh (Srikakulam District) exists in both islands; barter of fish and rice took place between the two communities took place during the days of settlement and colonization. Today, there exists a Bengali fishing community on the two islands, while other Telugu migrants from Andhra Pradesh have joined their kinsfolk, especially on Havelock. The base of the islands' economy was formed by agriculture and fisheries. Sandy beaches and coral reefs have now made these locales growing centers for tourism. The slow and quiet pace of life by the by the sea has been transformed by rampant tourism growth. While it has enabled hoteliers and some locals to

make a livelihood from tourism, the rapid increase of tourists has led to problems of waste disposal, coral reef destruction and rising prices.

5. SocMon at Havelock & Neil Islands in relation to RJMNP

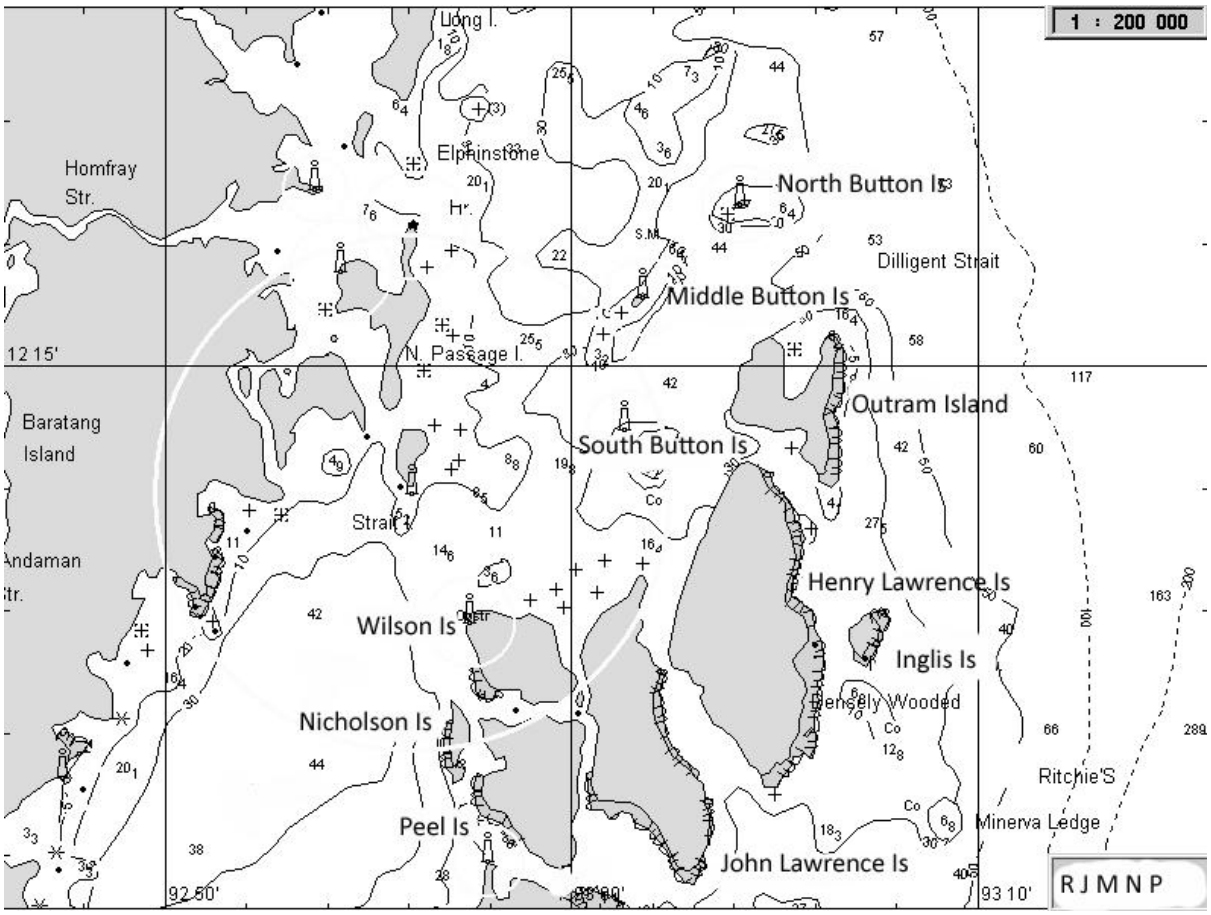
The Mahatma Gandhi Marine National Park (MGMNP) off Wandoor was the first region in the Andaman and Nicobar archipelago to be declared a marine park in 1983. ANET conducted SocMon activities in this region in 2001-2002. This work recognized the increased reliance on fisheries as a source of livelihood, as well as the rising tourism-related pressure on MGMNP. It stressed the need for increased local and stakeholder participation to effectively manage the marine park as well as the need to enhance infrastructural capability. The Rani Jhansi Marine National Park (RJMNP) was notified in 1996, though its management plan started taking shape more than a decade after, and is still being deliberated. SocMon was conducted at Havelock and Neil islands adjacent to the Marine National Park (RJMNP) given the various uses of the Marine Park by various stakeholders on the islands. Our brief experience at Wandoor (Singh, Biswas et al. 2002) and Havelock (Deb 1998) identified the need to enable mechanisms of management and use of the park by all stakeholders. Havelock is one of the few islands in the Andaman and Nicobar Islands where tourism development has been permitted and has boomed, following a different trajectory from Wandoor; Adjacent Neil Island, though smaller, faces a comparable amount of pressure for tourism development and is experiencing similar economic and livelihood changes. The islands have been gaining importance as prime tourist destinations over the past decade, but without the required capacity and coordination from all players (beginning with the government), the fallouts of these developments are being felt almost simultaneously. Active governmental advertising post tsunami has brought in investment and given a boost to tourism, but the lack of adequate safeguards with regard to carrying capacity of these small islands, skilled services, and manage the very resource that attracts tourists has meant that livelihoods have not benefitted from tourism, and in some cases have been adversely affected. The number of dive centers has increased from 2 in 2006 to 9 at present on Havelock Island, and mushrooming local shops, small eateries and transport facilities cater to the tourism industry on these islands. With more resorts and lodges being developed, it is expected that the need for increased planning as well as managerial mechanisms will need to improve to sustain these enterprises while conserving the very resources that the tourism industry is dependent on. Additionally the fisheries sector is expanding to cater to local demands as well as export markets, relying on the very same resource of coral reefs and the marine environment for its own growth. The region is a significant hub for the fishing communities, though the extent and nature of their dependence and reef usage is not exhaustively quantified as yet. Baseline information collected by ANET in 1998 from this area (Das 1998; Deb 1998; Maheswaran 1998; Andrews 2000) is outdated by the rapid change in the region. Though the earlier documentation describes communities, livelihoods and some natural resource dependence on the island, the current pressures vis-a-vis tourism development, external markets and linkages, fisheries and dive tourism are not documented as yet. Few Indian tourists visited Havelock at the time, and a handful of foreign tourists arrived occasionally on the few ferries available during the week. The situation is an extremely contrasting one at present, where in season (August to May), both Havelock and Neil experience a daily deluge of tourists arriving on more than 3 ferries a day; many Indian government employees also avail the facility of 'Leave Travel Concession' and arrive in large numbers. All these developments have

resulted in greater material and infrastructural needs to cater to the tourist influx, while disposal of waste/consumed materials is still a factor that hotels, visitors, local villagers and islanders contend with as a visible problem and environmental hazard. Some measures to deal with the problem of garbage disposal have been undertaken especially by the police department, few local hoteliers, and responsible visitors; despite these, the effort is not continuous and needs to be tackled as a systemic problem for the entire island and all users, and not just by a few interested individuals or organizations. Coral reefs and nearby beaches bear testimony to this fact given large number of glass and plastic bottles of local origin as well as those that get washed ashore from beyond Andaman territorial waters. Changes in global climate events caused by the El Niño Southern Oscillation (ENSO) events, warmer sea surface temperatures and storms have also taken their toll on fringing coral reefs and fish life.

Implementation of SocMon and related activities at this point in time would be a valuable tool to influence and guide tourism development and support management and development of the Marine National Park, with a focus on positive livelihood and conservation outcomes. This can potentially be used as a model for other sites in the region, where pressure for tourism development is high. The Park is under the purview of the A&N Forest Department, which is still in the process of setting up a management structure to specifically cater to RJMNP. No systematic inventory of coral reef resources for all the islands has been undertaken, though research and sampling is being conducted by the Zoological Survey of India (ZSI), Port Blair Station as a monitoring exercise (*work in progress*) (Mondal and Raghunathan 2011; Mondal, Raghunathan et al. 2011). However, SocMon and the biophysical monitoring and survey were conducted separately under two different projects, by different agencies. Greater effort is needed at the Divisional level to ensure participation of management authorities, NGOs, dive shops and local communities in monitoring activity which may develop into a more comprehensive monitoring protocol for the Park. It is hoped this SocMon exercise will help aid and influence future courses of action towards understanding the nature of dependence and use of the park by local communities as well as the tourism industry. What emerges from research on successful park management worldwide is the importance of community participation in framing rules and influencing enforcement and sanction. This is a feature that is lacking in the Andaman Islands, which is characterized by a more top-down approach to resource management, often inducing conflict and resulting in week enforcement as issues to be tackled, whereas communities in these islands have indicated willingness to participate in a combined effort. Greater success can ensue from facilitating this approach based on principles of adaptive management, given the dynamism experienced in the region.

Much work relating to the rationale for societal participation as well as use and regulation of conservation areas with simultaneous development of sustainable modes of tourism, business and local livelihoods has been researched across the tropics (Ruddle 1998; Aswani 1999; Vousden 2001; Agardy, Cruz et al. 2002; Curran, Kumar et al. 2002a; Johannes 2002a; Christie, McCay et al. 2003; Aswani and Hamilton 2004; Christie 2004; Kritzer 2004; Beger, Harborne et al. 2005; Cinner, Marnane et al. 2005; Lundquist and Granek 2005; McClanahan, Marnane et al. 2006; Blount and Pitchon 2007; Christie and White 2007; Cinner 2007; IUCN-WCPA 2008; Wamukota, Cinner et al. 2011). The need to continually assess and develop capacity toward sustainable reef tourism and coral reef and fisheries management is one of the prime reasons for conducting activities such as

SocMon in this region (Bunce, Townsley et al. 2000; Cattermoul and Campbell 2003; Hoon V, Sriskanthan et al. 2008; Loper, Pomeroy et al. 2008).



Map 2: Bathymetry of the archipelago

6. Methods and general framework of the project

The purpose of SocMon in the vicinity and precincts of RJMNP was to create sample baseline socio-economic information to understand the nature of anthropogenic activities based on/ around coral reefs. No human community lives within the Marine National park, though the area is a resource catchment for various stakeholder groups from the inhabited islands of Havelock & Neil, and purposes range from rural livelihoods, enterprises in tourism and fisheries to illegal logging and poaching. Primary stakeholders were identified and questionnaires (see annexure) were designed to elicit information from each stakeholder group in order to create a profile of the variety of stakeholders and the nature of community engagement with coral reefs around their islands. Secondary stakeholders were similarly identified based on previous work (Deb 1998) as well as during the scoping exercise carried out during the project inception through informal interviews with local islanders, regarding those facets of livelihood and commerce that emerged from indirect involvement in tourism.

Primary stakeholders consist of the islanders, fishers, dive shops, the Havelock division of the A&N Forest Department and tourist resorts. While our main focus was on Havelock Island, the spread of tourism and rapid related development to Neil Island also made it vital to explore. Secondary stakeholders are those with agricultural-based livelihoods, those involved in tourist transport infrastructure, those who run or own eateries and other small businesses catering to tourism, as well as all relevant government departments (including village level administrative units).

6.1 Carrying out the socio-economic assessment

The field team consisted of a project coordinator, site coordinator, research assistant and 6 local field assistants. Work was divided as such: the project coordinator designed the basic questionnaires and time schedules in consultation with the site coordinator and research assistant and helped with data consolidation toward the end of the project. The site coordinator and research assistant were assigned duties to collect periodic (ideally weekly, and monthly) data toward characterizing stakeholders. Periodic data collection was conceptualized to identify most visited dive sites and visitor capacity during a 3-month period from dive shops which chose to cooperate with this project; creating basic profiles of other stakeholders was conducted through a single questionnaire survey for each stakeholder group identified. After a basic introduction to field techniques and schedules, local field assistants collected data from the local communities including fishers. The local assistants were suggested to us by the village governing bodies (*panchayats*). One local youth group (The Gandhi Memorial Youth Club) on Neil Island suggested a person to facilitate our work on Neil Island.

6.2 Data Analysis

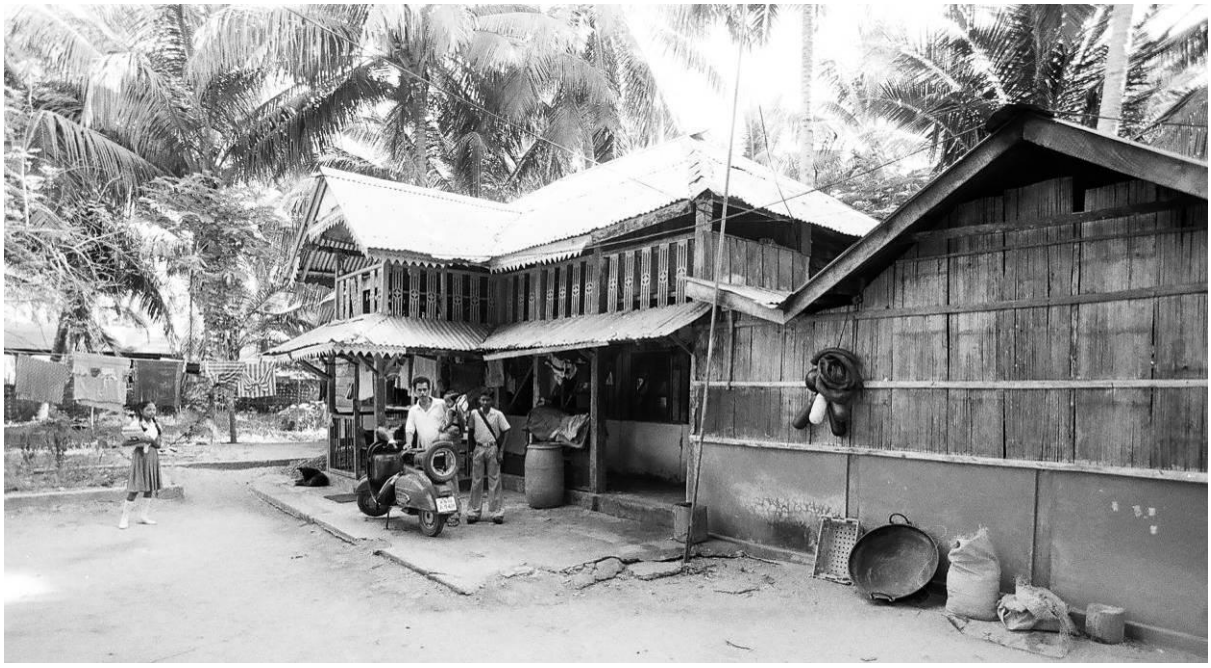
Data was compiled into an excel sheet (MS Office) and used for consolidation, analysis as continuous data where applicable. Other data in the form of interviews, notes and group discussions were recorded as either notes, and in some cases recorded using a Dictaphone.

6.3 Validation

Once the data was analyzed, two visits were made to conduct discussions with key informants and participants to validate the information. As during the tourist season, a full fledged meeting with all stakeholders was difficult to execute, given various engagements that many personnel had, individual meetings with select participants was conducted by the project coordinator.

6.4 Workshop

The Divisional Forest Officer on Havelock Island, Deputy Superintendent of Police, Dive Shop managers, *Panchayat* representatives and tour agents were consulted periodically and briefed on progress, gaps and for leads. With the exception of a few that chose to remain out of the ambit of this exercise,3 dive shops on Havelock and the sole dive shop on Neil participated in this preliminary SocMon exercise. Local community leaders such as the Fishermen's Association and a Mahila Mandal (women's group) were also consulted at various points during the survey. An initial workshop was conducted on 27/11/2010 (Annexure 1)



Photograph 3: A settler's residence on Havelock Island

7. STAKEHOLDER PROFILES

8. Community surveys

Methods:

Questionnaires were used by field assistants to interview 200 local households on Havelock and 95 households on Neil Island. The questionnaire based interviews covered two *panchayat*s (Govind Nagar and Shyam Nagar) on Havelock and the singular one in Neil. These questionnaires resulted in datasheets that were entered into a worksheet for analysis. Informal interviews with random heads of households and elders on their perceptions and relating to change were recorded using a dictaphone after seeking permission on describing the purpose of this exercise. Group discussions with settlers of regions on both islands were conducted during the course of the project to consolidate information and provide consensus on information relating to understanding livelihoods. Data collection began in January 2011 with the local community surveys, alongside meetings with dive shops and resorts to create basic profiles. The data profiles that follow aim to provide a glimpse into livelihoods of the local community from a perspective of association with the reef; this is only directly addressed through a question that elicited responses on local perceptions on utility of the reef.

A majority of questions are centered toward giving a glimpse into the drivers of livelihoods of the local communities. Interviews with individuals and small groups were also conducted from time to time by the Project coordinator to provide other perspectives that may not necessarily be reef-related, but concerned livelihoods and recent developments on their islands.

Photograph 4: Dock for fishing and other water craft on Havelock Island

8.1 Basic statistics of Havelock and Neil Islands

Table 1 Village wise Statistics of Havelock Island

Revenue area in Hectares (Ha)	1. Govind Nagar - 359.67 2. Vijay Nagar - 369.45 3. Shyam Nagar - 311.14 4. Krishna Nagar - 363.24 5. Radha Nagar - 391.63		
Population	Total - 13,500 (approx). Village and gender based detail not available. Refer Economic Census published by Directorate of Statistics.		
Agricultural land (hilly/horticultural land, gazing or gaucher land and paddy land) in Hectares (Ha)	1. Govind Nagar - 595.75 2. Vijay Nagar - 368.20 3. Shyam Nagar - 309.75 4. Krishna Nagar - 363.05 5. Radha Nagar - 391.56		
Water sources - wells & ponds	Location	Wells	Ponds
	Govind Nagar	40	15
	Vijay Nagar	30	10
	Shyam Nagar	30	10
	Krishna Nagar	20	05
	Radha Nagar	20	10
Schools	05 Schools :- 01 Sr. Sec School – Govind Nagar 04 Primary Schools – Govind Nagar-I, Vijay Nagar (Kalapather), Shyam Nagar & Radha Nagar.		

Medical facilities	01–Primary Health Centre, Govind Nagar-3 03 – Sub Centre (Krishna Nagar, Vijay Nagar (Kalapather) & Strait Island).
Forest land in Hectares (Ha)	9.560 (details for various regions were not available)
Solar or other infrastructural installations, Fair Price Shops (FPS)	• 01 Solar Plant of capacity 50 Kilo Watts at Radha Nagar (presently not functioning) • 05 Nos FPS:- 02 – Govind Nagar-I & 03 – Govind Nagar -3.
Land sold / diverted toward development / tourism	Not available

Source: Office of the Patwari (village revenue officer) Havelock Island

Table 2 Village-wise statistics for Neil Island

Revenue area in Hectares (Ha)	1. Neil Kendra - 108.31 2. Laxmanpur - 172.64 3. Ram Nagar - 192.07 4. Bharatpur - 187.92 5. Sitapur - 555.44			
Population (gender specific)	Location	M	F	Total
	Neil Kendra	612	436	1048
	Laxmanpur	199	208	407
	Ramnagar	399	348	747
	Bharatpur	350	271	621
	Sitapur	142	126	268
Agricultural land (hilly/horticultural land, gazing or gaucher land and paddy land) in Hectares (Ha)	1. Neil Kendra - 24.30 2. Laxmanpur - 59.96 3. Ram Nagar - 121.40 4. Bharatpur - 71.60 5. Sitapur - 63.20			
Water sources – wells & ponds	Location	Wells	Ponds	
	Neil Kendra	28	01	
	Laxmanpur	30	02	
	Ramnagar	49	03	
	Bharatpur	29	02	
	Sitapur	23	03	
Schools	04 Schools :- 01 Sr. Sec School – Neil Kendra, 01 Middle School – Sitapur, 02 Primary Schools –Bharatpur & Neil Kendra			

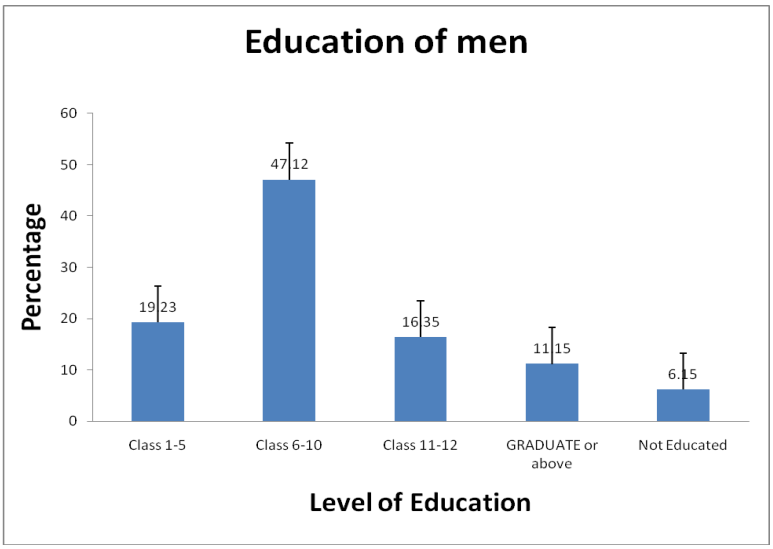
Medical facilities	01–Primary Health Centre, Neil Kendra 01 – Sub Centre at Sitapur
Forest land in Hectares (Ha)	1. Neil Kendra – Nil 2. Laxmanpur - 57.865 3. Ram Nagar - 22.00 4. Bharatpur - 85.86 5. Sitapur - 294.62
Solar or other infrastructural installations, Fair Price Shops (FPS)	• No Solar Plant or other infrastructural installation installed at Neil Island • 03 Nos FPS (02 at Neil Kendra & 01 at Bharatpur).
Land sold/diverted toward non agricultural activities/tourism	Not available

8.2 Community Survey results:

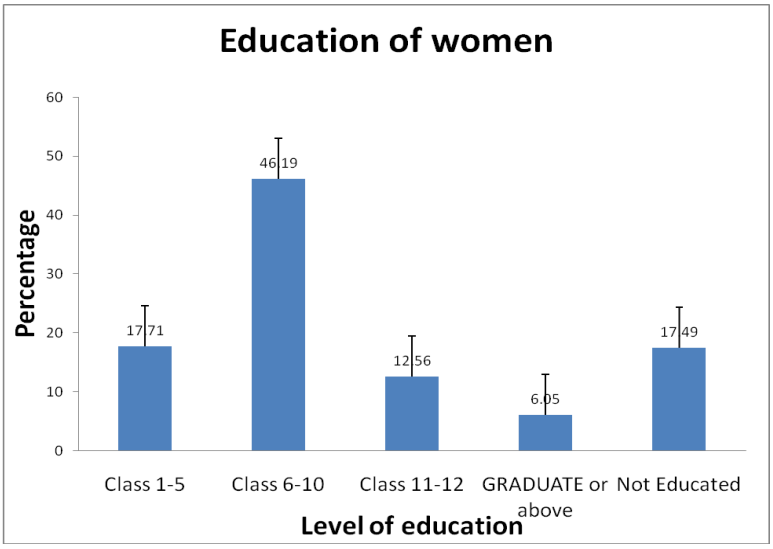
8.2.1 Education

Education has improved ever since the early days, with access to local schools as well as further education in Port Blair or on the mainland. The gender specific graphs below show the percentage of men and women of households who are educated (or not) to some degree. Education improves with the third generation (Education of children) who have had access to better education and also need it more as employment opportunities in agriculture and cash crops diminished due to the growing population and limited land availability.

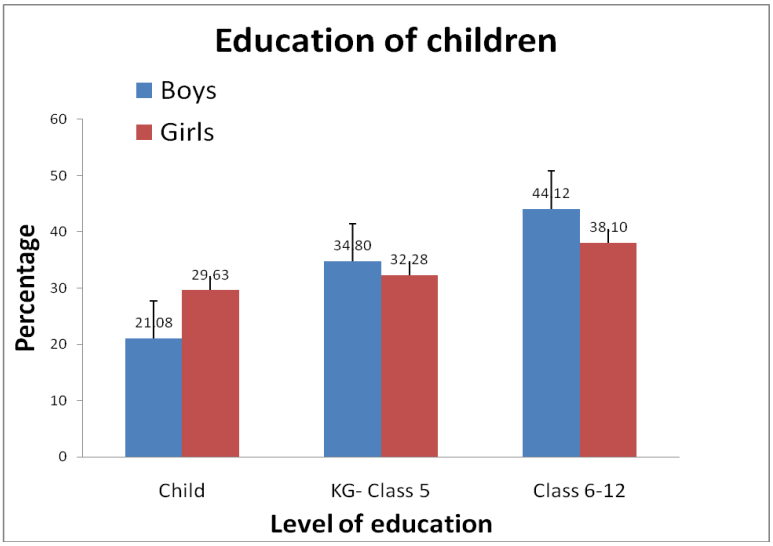
With increased availability of schools, improved educational facilities and growing families, enrollments at schools is considerably higher than in the past. Most adults interviewed expressed concern at the outcomes of this development as there are limited employment opportunities and skilled labour is requisite for employment in most tourism-based activity, especially a requirement of knowledge of the English language, which is poor amongst most school students. This is improving given the recent developments on the islands and a growing number of students are emerging with a better grasp of both English and the importance of coral reefs and marine resources and their linkages to employment in tourism- based activity as a source of income.



Graph 1: Education of men



Graph 2 Education of women



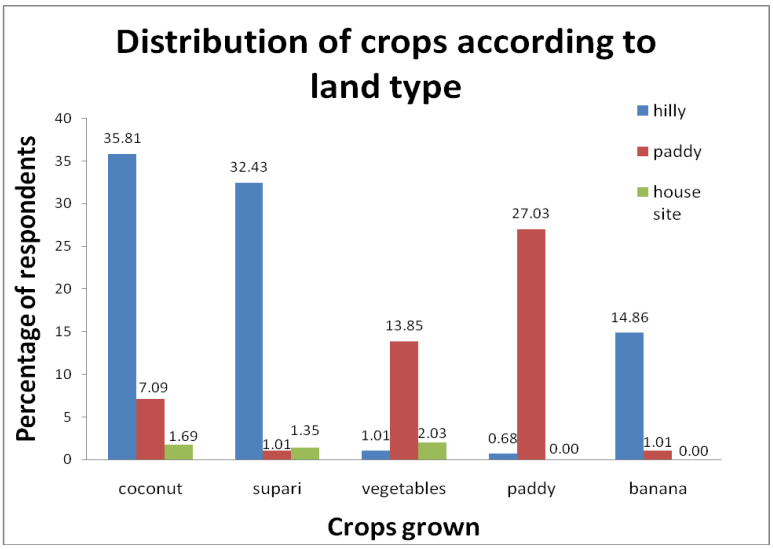
Graph 3: Education of children

A majority of those interviewed through both individual interviews and group discussions at home or in villages did express an increasing trend of reliance on tourism for economic activity, while a lot of discontent was also expressed in terms of changing mores and cultural transformation resulting from exposure to various foreign nationalities and cultures.

8.2.2 Land utilization

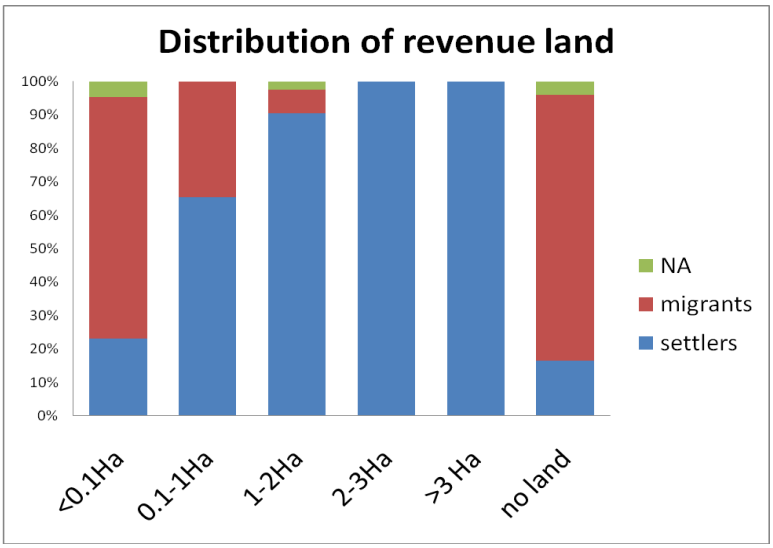
Land use is a fast changing phenomenon especially on Havelock with the sale or lease of land to resorts and hoteliers for tourism development at high prices (close to a few crores of rupees for more than 3-4 acres of land). From being a primary producer of agricultural and cash crop products, local settlers today depend more on the Fair Price Shops for purchase of government rations, including staples like rice, rather than on growing it themselves. This has occurred due to two primary reasons: (a) increase in family size and reduced availability per dependent/inheritor (among siblings) of cultivable land and (b) non-mutation of land titles to dependents by land owners. The latter implies that children have not fully realized their inheritance of small land holding from the larger land holding of their parents and either leave the land fallow or lease it out for share-cropping to migrant labour.

Land that was made available to settlers was divided into hilly and flat land, for crops including cash crops and paddy/vegetable cultivation as well as a house site for residents. This format has seen encroachments largely above the existing land on hilly land where cash crops such as betel nut are planted along hill slopes, while paddy is cultivated in flat land during monsoons as a seasonal crop.



Graph 4: Distribution of crops according to land type

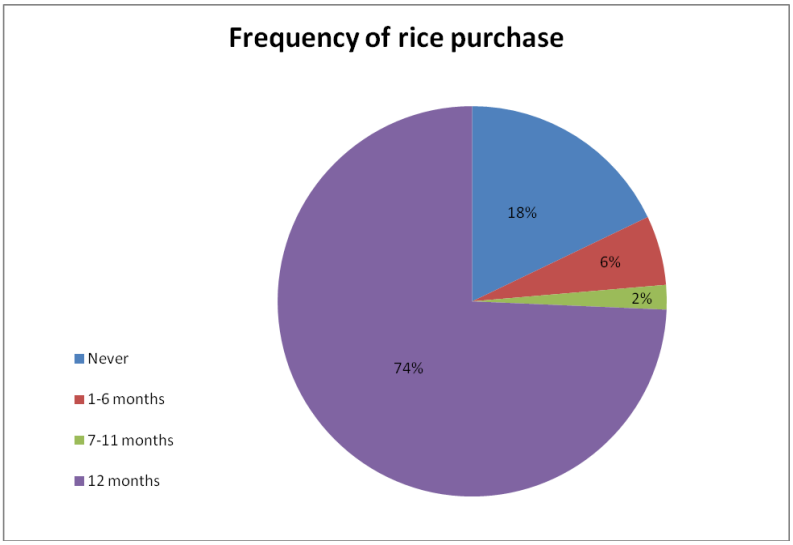
While an exact picture of past or present land utilisation was not possible to reconstruct using available data and statistics, ethnographic interviews with settlers and long term migrants reveal a change in land utilisation with an increased stress on share-cropping largely for growing vegetables that are sold in local markets as well as exported to Port Blair.



Graph 5: Distribution of revenue land

Migrants play a significant role in land utilisation that is not adequately reflected in our data and thus not fully presented; this occurs through partnerships they form with land owners or their descendants to engage in cultivation of land, or additionally work in nearby tourism related ventures such as bakeries, laundries or vehicle rentals. A significant proportion of land has also been sold or leased to resorts and hotels,statistics of which were not available. This land conversion has resulted in the reduced production of agricultural crops in comparison to the past. While coconuts have realised an increased value due to tourism, betel nut production continues to increase for some landowners as a cash crop. This shift in addition to the growing population and limited availability of

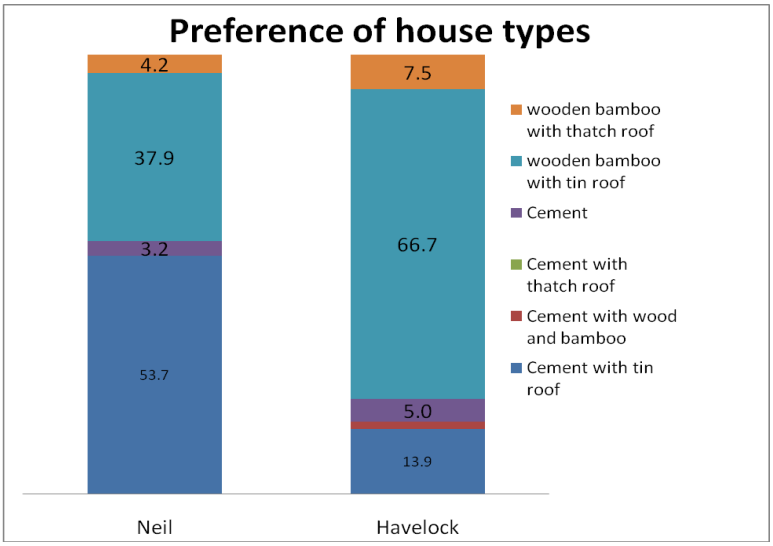
land for paddy cultivation, has seen an increased dependence on the market to source rice, which was formerly cultivated and consumed by farming families.The frequency of purchase of rice reflects this changed circumstance with the inability of the limited land available to cater to needs of the entire settler population through agricultural production such as rice cultivation. Given demographic growth as well as economic changes that have come about through requirements for tourism development, transformations in lifestyle and livelihood means have taken shape.



Graph 6: Frequency of rice purchase

This can be used to illustrate change in livelihood consumption and patterns with demographic and economic changes from relative self reliance to reliance on the market as a result of migration, development and changed land utlisation patterns. This is but a small ramification of the larger picture associated with the Islands of Havelock and Neil, where more pressing issues exist in the management of garbage disposal, generated because of tourism or the need to increase infrastructure and establishments to cater to increased demands of lodging and boarding facilities.

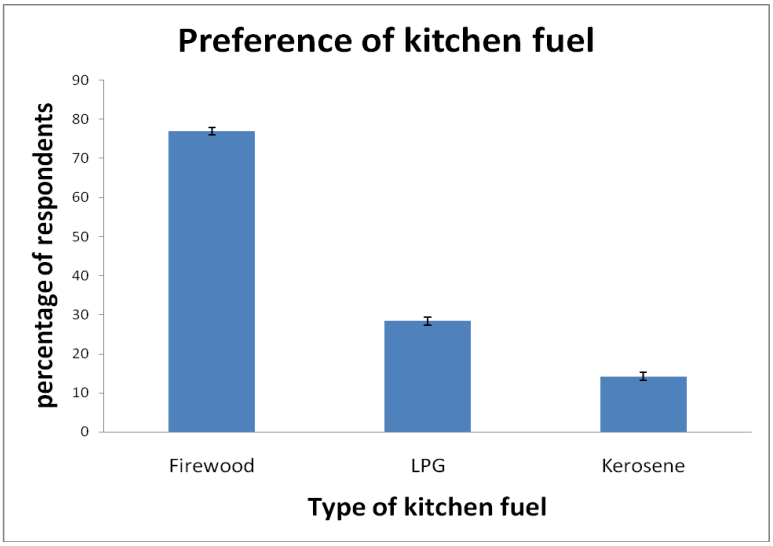
These changes are often not in consonance with perceived changes visualized as outcomes of desired economic development. Basic amenities of the local population continue to remain similar as in the past. This stasis is reflected in local house types, sources of drinking water and cooking fuel in use by the growing local population.



Graph 7: Preference of house types

While a majority of houses were constructed of wood and tin sheets, growing affluence has seen concrete structures sprouting in small numbers on both Havelock and Neil Islands. Wood is replaced after a considerable period, excepting those houses where poles and thatch are replaced frequently. Our data collected on firewood, and wood (poles, beams) collected for construction in does not paint a true picture and is thus not presented, but despite the officially low figures, there continues to be a considerable dependence on nearby forests for timber and thatch, including on those in the islands of the RJMNP. Illegal exploitation of timber has boomed along with the construction of so-called 'eco-friendly' cottages and resorts constructed with a significant amount of timber and forest produce, some of which are sourced illegally beyond government-approved saw mills or timber depots.

Both islands, with their intensive agricultural practices, were infamous for fertilizer and pesticide use for increased productivity in cultivation. When the islands were initially colonized, farming practices were completely organic and benign and conformed to traditional practices. Inputs from agricultural department staff in a bid to increase production to cater to increased demands of a growing population largely in Port Blair has led to the shift to inorganic cultivation.



Graph 8: Preference of kitchen fuel

From our community survey, 32% of farmers interviewed (n=296) use fertilizers and pesticides, while 68% have given up the use of inorganic cultivation. Inorganic cultivation has been practiced for about 30 years and run-off induced damage to coral reefs is visible at Neil Island in particular. Over the years inorganic agriculture is claimed to have reduced with some farmers experiencing negative fallouts and awareness leading to shifting back to organic practices; despite these developments a considerable number continue to use fertilizers and pesticides given the reduced fertility of the soil. On the small island of Neil, there were at one time close to 5-6 shops in a single bazaar selling inorganic fertilizer and pesticides. The Agriculture Department, which a few decades ago advocated the use of inorganic chemicals, has now collaborated with an NGO to build local capacities for organic farming. This is also a result of a perceptible increase in the number of health problems (mostly respiratory and vision-related) among farmers on the island, and informal interviews revealed that a recent death was suspected to be linked to excessive chemical use. It has also had a significant, though as yet undocumented, effect on coral reef health, fish diversity and algal proliferation around the island

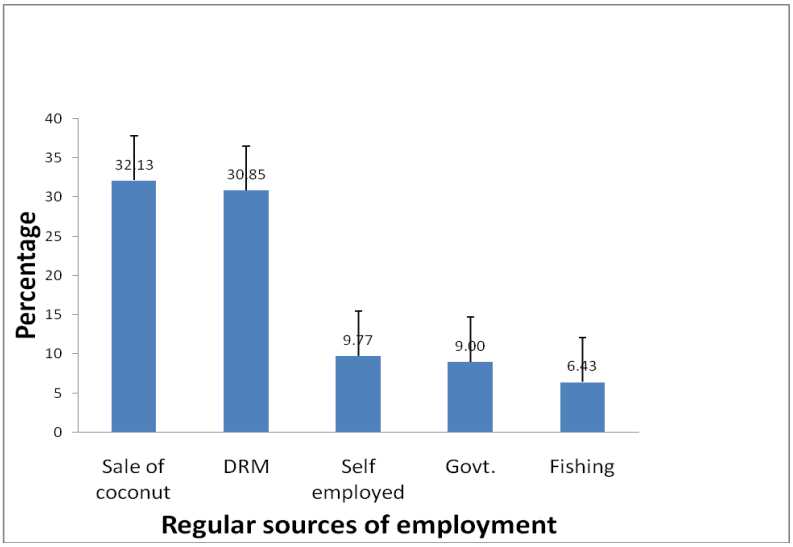
8.2.3 Employment and income

With the early emphasis on agriculture as a source of employment and income, the practice continues, albeit with the help of migrant labour and in some cases settler families who continue their agricultural practice. Diversification of income sources has brought about this change along with previously mentioned factors, though of all crops, sale of betel nuts and coconuts continues with renewed vigor, and with low investment and high demand, it is the preferred form of land use and source of income.

Graph 9: Employment sectors- Men

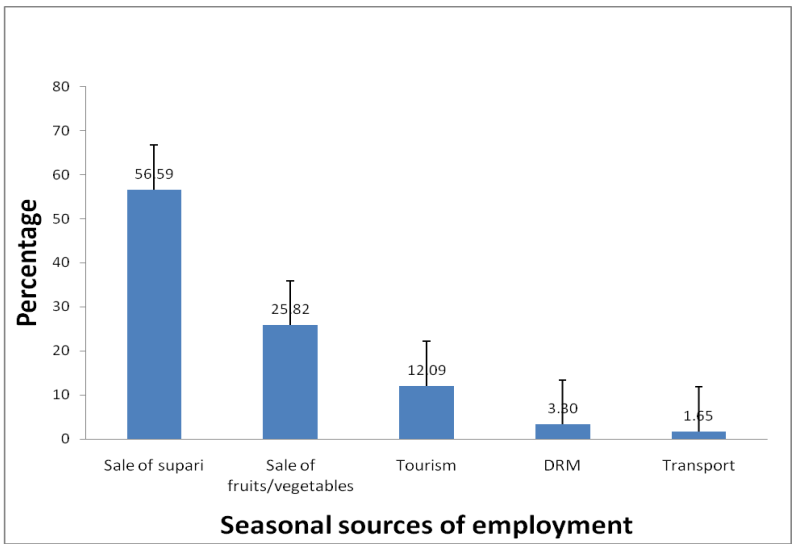
Graph 10: : Employment sectors- Women

In the graphs above, this activity and vegetable farming constitutes the category 'Agri' (implying Agriculture), while 'Pvt' refers to private employment ranging from petty shops and self employment, seasonal employment in construction, indirect and direct involvement in tourism related activity; employment in Government establishments is also common as in the past there was no other major source of employment. It continues to be the most preferred source of employment given the added benefits of availing old age pensions, perks and access to other livelihood requirements as well. Employment in the tourism sector, especially with resorts or outdoor sport is not reflected here, as data collected did not cover this detail from all household respondents. However, it is reflected in the section on resorts. Women on both these islands contribute to household incomes in various ways, either through direct employment and their participation in Self Help Groups (SHG's) or in being employed in tourism related activity, though this is a small percentage in comparison to the men.



Graph 11: Regular sources of employment

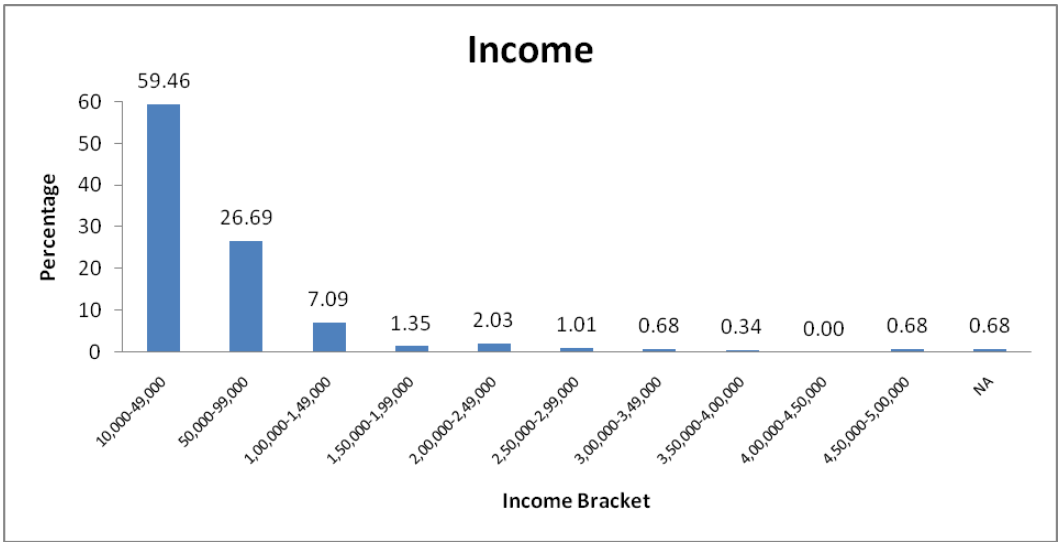
Given the seasonal nature of livelihood activity, be it tourism related or agricultural based, the two monsoons, the north - east and the south-west, also determine whether activities are seasonal or regular. Sale of coconuts includes tender coconuts to drink, as well as those processed as copra for the extraction of coconut oil. Daily Rated Mazdoor (DRM) [or daily wage labour], is another source of employment for most men and some women, given construction activity, infrastructural works both in private establishments and in governmental works, while other sources of employment are used by much smaller percentage of the population.



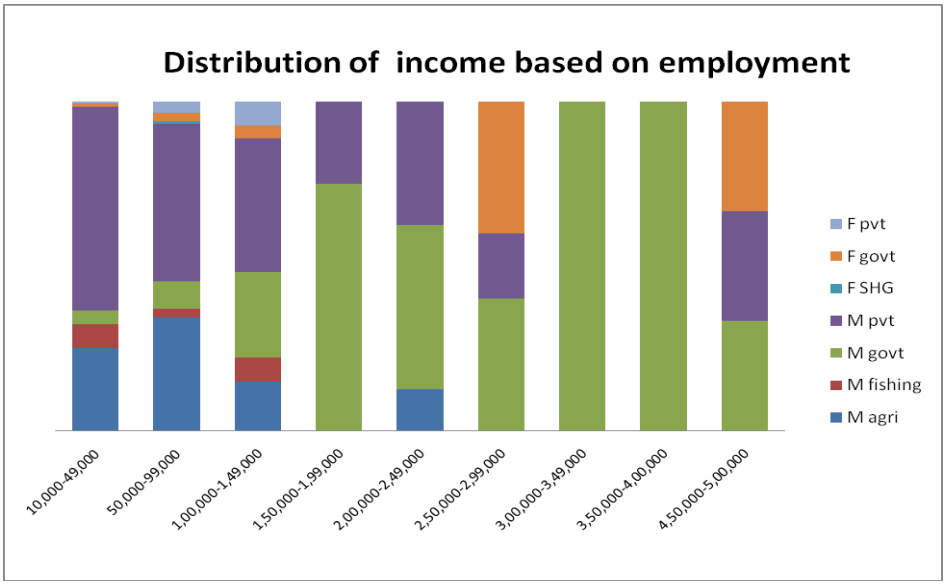
Graph 12: Seasonal sources of employment

Similarly with seasonal employment, sale of agricultural produce such as betel nut or '*supari*' is the most common source of income for local communities, with vegetable production by migrants and

settlers coming in next. Tourism as an employment opportunity is reflected as a smaller percentage despite petty shops and other activity including transportation to ferry tourists to and fro across the island. In general, tourism hasn't taken a prominent position in the source of income for most, with other sources of income providing adaptability in dealing with potential negative economic changes in the tourism sector. From our survey, the estimated annual income distribution is between INR 10,000.00 to INR 5, 00,000.00.



Graph 13: Income distribution among population surveyed



Graph 14: Income and employment

Given the various sources of income we categorized employment sectors of men and women into private enterprise (M pvt, F pvt), Government employment (M govt, F govt), women in Self help Groups (F SHG), men in agriculture and fishing (M agri, M fishing) as sources of employment. This is described by the distribution above which attempts to show the diversity of income sources.

8.2.4 Perceptions on the reef and local concerns

Respondents at Neil and Havelock Islands were asked of their perceptions on the utility of coral reefs that surround their islands as well as of any concerns they were keen to express on the state of change with tourism and developmental booms. Asking these questions is tricky given that firstly, all islanders are either first or third generation settlers, who have land-based livelihoods through agriculture and cash crops, with fishermen being a small percentage of the entire demography. The general perception towards coral reefs has until recently been as the natural habitat for colourful fish and categorized along with rocks. Secondly, across the Andaman Islands, Governmental inputs and infrastructure were until recently the only developmental changes deemed possible, while local participation and consensus took a back seat. Mechanisms of change such as building capacity, understanding information needs, while considering socio-economic vulnerabilities in the development process and thereby informing and influencing (Cattermoul and Campbell 2003) a sustainable process of economic change as well as environmental sustainability have not been fully realized here. The 'private sector' was until recently non-existent in the developmental process of these and other islands in the Andaman Archipelago. Both these facets in the social and economic developmental processes of these two islands in particular have seen the entry of private enterprise through tourism. This has had a positive influence in broadening worldviews while also bringing on cultural change that some settlers are not comfortable with. On the downside, skilled workers are few and the importance of education and notions of sustainability are aspects that islanders and tourism enterprises contend with and attempt to improve.

Having said this, knowledge or even perception of the reef is extremely limited, though there is change in perception. Through previous engagements with these communities and witnessing a younger settler generation growing amidst tourism development, adaptations to livelihoods are very dynamic. Positively such change is helping to generate debate towards developmental opportunities and exposure to reef-based tourism is on the increase. There was only one respondent who asked for tourism to be stopped; when ANET had conducted a socio-economic appraisal on change in Havelock (Deb 1998), there was significant antagonism to tourism development and cultural change given the fact that all of a sudden there were foreign visitors visiting beaches in scant clothing, for villagers who had never interacted with western visitors. That was twelve years ago, and change is very visible through sale of land, burgeoning shops and eateries and other small scale and large scale economic activities being invested in by local communities themselves.

A majority of respondents claimed low awareness on the utility of the reef, while responses such as viewing reef based tourism as a beneficial source of income generation and as barriers to coastal erosion scored significantly. We interviewed 296 people, from whom multiple responses were elicited from some, while some others claimed low awareness. Their responses varied but through a careful scrutiny these were clubbed into 8 categories based on the nature of responses:

(A) Low awareness
(B) Prevents coastal erosion
(C) Induces wave action
(D) Formed the island
(E) Fish nursery, protection, food for fish
(F) For tourism, helps generate local income
(G) Important natural resource, for future generations

(H) For fishing and fish diversity

Table 3: Perception of the reef

Number of responses:							
A	B	C	D	E	F	G	H
156	67	2	4	55	68	6	3

Along with a question on the perception of the reef, we also included space for respondents to suggest what they perceive as important improvements needed in livelihoods on their islands. Among the 296, some of whom gave multiple responses, some others chose not to respond. Responses varied but through a careful scrutiny these were clubbed into 20 categories based on the nature of responses:

(A) No comment
(B) Tourism development
(C) Environment conservation needed
(D) Improved water supply
(E) Administrative reforms (various types for accountability and reduce bureaucracy)
(F) Agricultural development
(G) Education system reforms
(H) Fisheries development
(I) Improved transport facilities
(J) Improved electricity supply
(K) Introduce more community development schemes
(L) Induction of more ferries
(M) Social welfare & poverty alleviation
(N) Media & communication facilities
(O) Sanitation & effective plan for garbage disposal
(P) Employment generation for youth & educated people
(Q) Improved medical facilities
(R) Requirement of a tehsil office for Havelock and Neil Islands
(S) Close wine shop
(T) Stop tourism

Table 4: Island development needs- perceptions of local community

Number of responses:																		
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
54	82	23	73	24	39	77	6	150	33	16	22	5	9	39	10	34	2	4	1

9. Fisher community surveys

Overview and summary:

The fishing communities on both these islands were visited by two field assistants who used questionnaires to collect basic data, as well as to rank preferred locations of fishing, bait sources and observations on charismatic species. Informal interviews as well as group discussion with members of their association and representatives with the project coordinator were conducted prior to the

questionnaire based interviews to help design questions. A final group discussion was also held with old members on both islands and newer entrants into the economy especially from Kalapathar village on Havelock Island. Group discussions and interviews were recorded after receiving the consent of participants for ease in transcription.

The first fishing communities to be settled on Havelock were 4 families of Telugu (Andhra Pradesh) fishermen in 1969; they used row boats to fish, while the first mechanized boats arrived about a decade later. Fishermen used to row through Ritchie's Archipelago as well as to Mayabunder or Port Blair in wooden dinghies to both sell dried fish and purchase fishing gear. Mechanized boats made a bigger entry in the 1990s. Bengali fishermen also established their craft alongside traditional fishermen such as the Telugu fisher folk who were settled primarily with tapping through the economic potential that the islands held. Apart from changes in their method of sale and barter of fish and rice from the old days, and more fishermen using Havelock and Neil islands as a base, the only other major development seen by the older fisher folk is the threat of restrictions into what is today become a Marine National Park. Many interviewees remarked on this facet sensing that their economic activity may be affected due to new restrictions that may be imposed on their use of common fishing grounds.

Photograph 5: Dock for water craft at Neil Island

The establishment of a marine park is not seen as a positive step as the development has been confrontational rather than participatory from authorities such as the Police and Forest Departments. During the course of group discussion when queried on their potential involvement in monitoring and sustaining the natural resources of the park, they were in agreement, but vouched that it was up to authorities who brought in new rules and demarcations to first allow them to participate in aiding the management of the park rather than prevent them from carrying out their economic activity. More recent developments from the local fishers experience have been that of

expanding reach of other fishermen from Mayabunder and Port Blair who also arrive in Ritchie's archipelago to fish. While they consider themselves to be local, the stake they have is not on par with that of the islands' fishermen.

Additionally, old time fishers claim that ten times the effort is required for a comparable catch from 30 years ago, which aids in their realization of dwindling resources. While near shore areas off Havelock were at one time productive fishing grounds, more distant fishing grounds are presently used given the greater intensity of fishing as well as increased demand for local and rising export markets, as well as the destructive nature of gear such as the 'ring jaal' or a kind of purse seine net that some fishermen from Port Blair have recently been using.

Photograph 6: Seine net on Neil Island that arrived from Myanmar on a raft during a cyclone in 2010

While gear that is distributed by the Fisheries department is acknowledged in general to be of good quality and non-destructive in comparison to nets with a large by-catch, the monitoring of developmental schemes and designation of zones have to be implemented. By-catch from purse seines or fine filament nets have also taken their toll, while local fishermen are unable to compete or defend their fishing grounds. They eventually look to Governmental authority for protection and implementation. Another destructive method employed by lobster fishermen from beyond Havelock was of their use of crowbars to crack open coral boulders which harbor lobsters. Additionally, the use of spears o hunt lobsters from crevices make it impossible to separate gravid females from males and other females, thereby slowly exterminating local populations. The local fishermen talk of a time when lobsters would on occasion get caught in their nets on their own, but after the rising demand from tourism and export markets increased the value of lobster, these destructive methods of maximizing returns have begun. Many fishers from Mayabunder and Port Blair frequent the archipelago's waters given the higher abundance of species such as lobsters and groupers. Local buyers of lobsters and groupers who cater to the export market, on occasion export close to 8000 kg of these targeted species on a monthly basis, while average sale of the total export-oriented catch is

estimated to be 3-4 tonnes per month. These licensed traders purchase fish directly from fishers and supply their stocks to larger agents at Port Blair. It was only in the past five years that an ice plant was constructed for the benefit of the industry. Until then the fishers bought ice at their own cost from Port Blair or salted and dried their catch. Some of the leaders also complain of inaction, after reporting the use of such inappropriate gear as well as of trawlers fishing within 6 nautical miles offshore. They claim the authorities they have complained to often shifted responsibility, and on occasion have asked the fishermen to catch the offenders and bring them to shore, rather than taking action themselves. Such grouses that the fishing community have with managerial mechanisms are not unique to Havelock or Neil Islands, and common across the Andaman archipelago. What is positive to note is their willingness to work provided they are given participatory rights as well as taken in confidence towards managing the resources they depend upon.

Photograph 7: Near shore fisher in his row boat at creek No: 6, Havelock Island

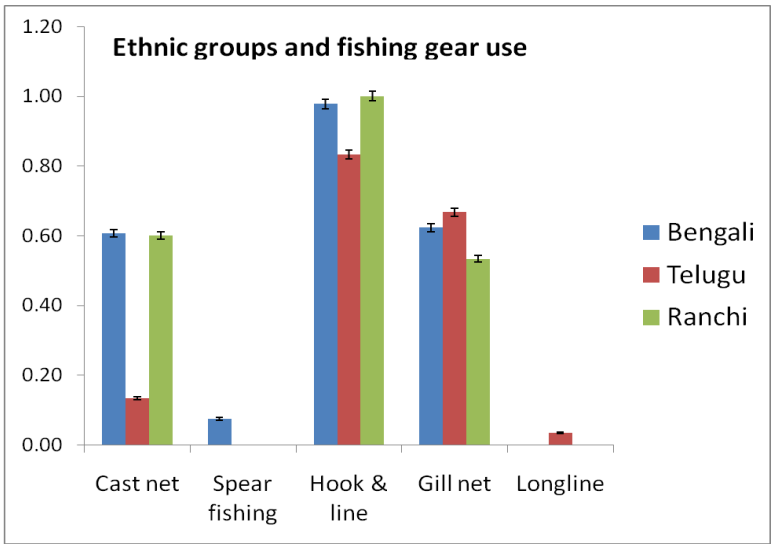
Through the SocMon survey, preferred fishing and bait sources were compiled from fishermen who source their own bait. Some regions fall within the present day marine park, which is a major reason as well as rationale for fishers asking for an inclusive managerial approach, and contributes significantly to their willingness to participate in monitoring activities of resources. The fishing regions are separate from bait sources though some overlap does occur, which further stresses the need for adaptive management . Our experience at MGMNP Wandoor, where we conducted the first SocMon exercise, was of negative fallouts where fishers are not included within the managerial mandate of the park. At the MGMNP, given their low stake and participation in managing the park, local communities are known to use the park to illegally fish, collect sand for construction (in the recent past) as well as to poach timber and sea turtles as well.

Survey results:

9.1 The nature of the stakeholder group

Of the fishermen we surveyed, 62% (n=71) were licensed fishermen who have been fishing from between 5-35 years. The oldest fisher folk are the Telugu fishermen who prefer gill nets and hook and line to other methods. While they prefer mechanized boats, Bengali fishers prefer row boats to fish along near shore areas and mangrove creeks. The kind of fish thus harvested is thus dependent on gear and fishing region. Other gear used to fish include shore seines, cast nets, crude spear fishing implements, long lines and troll lines. Spear fishing for lobster and grouper is locally conducted by Bengalis while boats include motorized dugout canoes (*bonga dungi* with inboard engine), planked boats (*takta dungi*), planked row boats (*halish dungi*) while sport fishers use more modern fiberglass hulled boats with outboard engines. A picture that emerged from our survey sheets on boats used is given below:

Percentage of those surveyed [n= 71]	ROW BOATS	MOTORISED BOATS	TOTAL
BENGALI (87.3%)	23	23	46
TELUGU (8.5%)	3	10	13
RANCHI (4.2%)	0	0	0



Graph 15: Ethnic groups and fishing gear

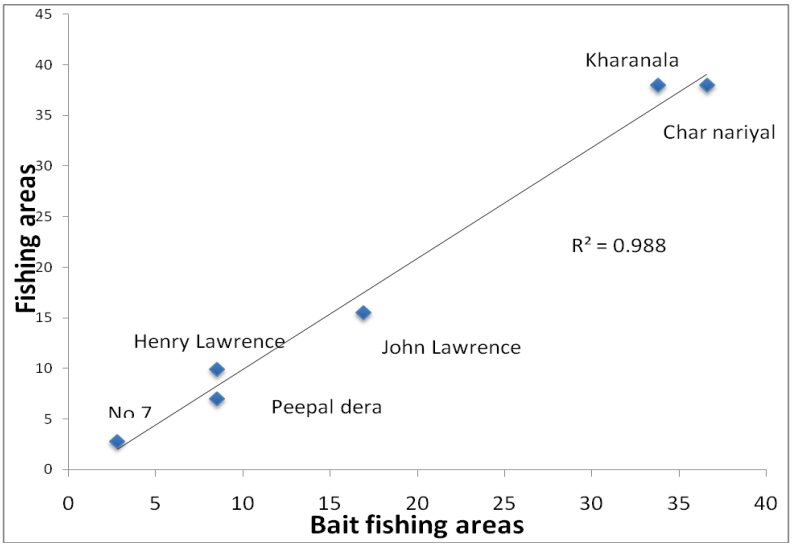
While licensed fishermen are those whose primary occupation is fishing, many unlicensed fisher folk are agriculturists, who sell their excess catch through licensed fishermen or are also spear fishers. Fluctuations in the nature of activity vary based on demand, for instance about a decade ago most Bengali fishermen were also engaged in shell fishing, while the Telugu fishermen have only been engaged in harvesting demersal and pelagic fishes. Some of these shell fishers later converted to lobster and regular fishing after stricter enforcement of shell fishing rules and increased catches of illegally procured sea cucumbers occurred in the last decade across the Andaman Islands.

Occupational diversity is also dependent on opportunistic ventures with high risk and high returns. Thus those posing as fishermen could also be involved in illegal timber or other such activity to

exploit natural resources from islands in the region, using the occupational title of 'fishermen' to traverse between islands, eventually damaging the reputation of genuine fishers. Outram, Henry Lawrence, Nicholson and Wilson islands have been used to illegally source timber, venison, and other natural resources by such groups, which have besmirched the reputation of fishers in general. Most Bengali fishermen also have land and plantations as additional assets either through ancestral inheritance or through kin group relationships, but this is not the case with Telugu fishermen who have a house site and no agricultural land.

9.2 Preferred fishing and bait regions and markets

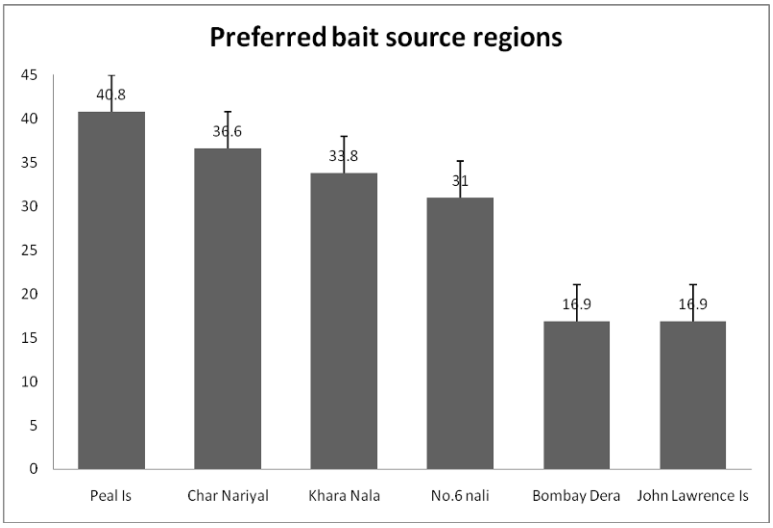
Preferred fishing and bait sourcing regions by both groups vary, though some overlap is present. Fishing regions off reefs adjacent to islands, channels, open sea and in mangrove creeks were correlated to fish catch, though a complete picture was elusive. Apart from the sites mentioned by respondents during the survey, sites within the National Park such as South Button Island, Outram and the channel between Henry Lawrence and John Lawrence, and off Inglis Island are among locations that are used to fish (Pers comm. Bidesi Roy, Fishermens Association Havelock; also see (Venkatraman 2011). This discrepancy has arisen due to fear of mentioning areas within the National Park, though our objective is to understand the reality of resource utilization while scoping for monitoring and conservation mechanisms. Fish caught is sold domestically for local consumption, while target species are sold to fish traders for export.



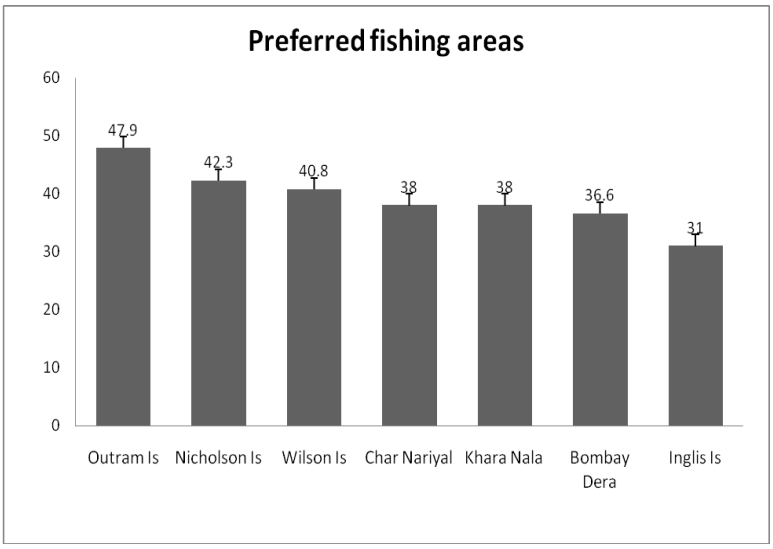
Graph 16: Overlap of fishing with bait regions

During the course of the survey six fish traders were present on Havelock while three were present on Neil. Fish sold in local markets largely are trevally, job fish, groupers, snappers, perches, emperors, mullets, sardines, mangrove cat fish and mackerel. Exported fish are specified species targeted for the export market (red grouper, coral trout, black coral trout, potato or camouflage groupers, seer or king fish). It may be pertinent to mention that prior to the commencement of the target species trade, species such as groupers were not a preferred fish for local consumption and would be sold whole at approximately Rs. 20.00.

Given the demand in south-east Asia, the export market increased the price to between Rs.600.00-Rs 800.00 per kilogram, bringing a large price for a previously non-targeted reef fish. Today in the markets of Havelock and Neil, groupers that are not bought by the fish traders for export are sold for local consumption. Two main fish landing sites are at Gandhi Nagar No. 3 at the Bongaghat, and the Havelock jetty region. Fishermen from Kalapathar also land their fish either at Gandhi Nagar or at Kalapathar itself. Subsistence fishers exist across the islands of Havelock and Neil who invariably use small craft such as row boats or who fish from the shore or along creeks. This group was not surveyed in particular as their range of influence was restricted to regions around the inhabited islands and did not include the Marine Park. Unlicensed fishers who are largely subsistence fishers on occasion sell their fish to the market through licensed fishermen.



Graph 17: Preferred bait sources



Graph 18: Preferred fishing areas

9.3 Expenses

Major expenses of the fishers surveyed include household expenditures (77%) which entail livelihood rations and education expense for children, purchase of new nets/gear (68%) and fuel for their craft. Subsidies to fishermen are available through various schemes of the Department of

Fisheries, Andaman & Nicobar Administration by which gear, craft, accessories may be purchased and overhauls conducted. These expenses apart, livelihood expenditures figure highly given an increasing cost of living in the islands influenced by emerging markets and increased disposable cash. We were told of widening income gaps among both fishermen and agriculturists given the tourism boom and emerging opportunities available to some.

Photograph 8: Sale of fish by fishermen's wives

9.4 Charismatic species encountered by fishers and locations

Our questionnaire requested fishermen for information on sightings of large bodied charismatic species such as whales, dolphins, dugongs and saltwater crocodiles. This was done keeping in mind that a potential role in monitoring the park could be the maintenance of records on sightings by frequent visitors to the waters and islands of the park, such as fishermen, and thereby acknowledge a means toward their stake apart from their use of the waters much before the park was conceived. The islands in the park provide suitable habitats for species such as dugongs and saltwater crocodiles, while highly mobile species such as whales and dolphins are also sighted. While sport fishing is conducted by 3 local operators, fishing trips for some visitors are organized by resorts or other private tour agents and these two can be seen as opportunities toward generating information that may be useful toward managing the park. Trevally, groupers of various species and sizes, marlin, tuna, dolphin-fish, and king fish are some species sought after by these enthusiasts, though a monitoring mechanism and database of catch and release is not maintained by any agency in this regard.

The species we label as charismatic species are Dugongs, Dolphins, Saltwater crocodiles, and Whales. Fishermen reported that dolphins (and porpoises) were commonly sighted from time to time in various locations, while Dugongs were most frequently sighted off beach number 5 on Havelock and Khara nullah along the east coast, while fewer sightings were reported from Inglis

Island, Henry Lawrence Island and off Char nariyal region on Havelock Island, followed by still fewer sightings off Radha nagar beach on Havelock Island and off Wilson Island. Saltwater crocodiles were most frequently sighted in the creek at number 6 on Havelock Island, followed by the region at Char nariyal and fewer sightings were reported from waters around Henry Lawrence and Wilson Islands. Whales were sighted off Inglis Island and the waters off Kalapathar on Havelock Island, as well as off North and South Button Islands.

The sightings were collated from our questionnaire surveys (n=71) and indicate the use of the area by fishermen as well as their encounters with these species; the data does not necessarily indicate an abundance of these species at these particular regions, while besides whales and dolphins, these particular regions are suitable habitats around which these species may be seen. This is important to note, as this information need not be interpreted otherwise, given the fear and danger posed by an animal such as the saltwater crocodile. All these species are mobile and thus this exercise was conducted largely to demonstrate that fishermen and others such as dive operators who frequent marine waters may be potentially useful partners and allies in monitoring the presence of such charismatic species and thus provide additional inputs toward managing such a Marine Park.

9.5 Involvement as primary stakeholders in monitoring:

An important question we tried to elicit an answer to was “How could you be involved in helping manage the Marine Park?” This was inadequately addressed partly due to the local field staff being ill-equipped in interview techniques, but also because, to a lot of respondents, the idea of involving local communities in monitoring and management seemed too radical. The management of parks and conservation areas in the Andaman Islands is of the conventional ‘top-down’ nature with exclusion and preservation being the priorities to ensure conservation. This approach has does not credit the possibility of local involvement and the inclusion of people as stakeholders to influence conservation and use. The project coordinator at a later date during group discussions broached the topic with both the Telugu and Bengali communities, not necessarily fishermen alone. The response was positive, as all were concerned about their livelihoods and saw potential in their participation if the opportunity arose. Therefore a statistic describing their willingness to participate is unavailable but consensus has emerged on their desire for increased responsibility and stake in managing and monitoring resources that they are dependent on.

10.Dive shops- and periodic monitoring

Overview and summary:

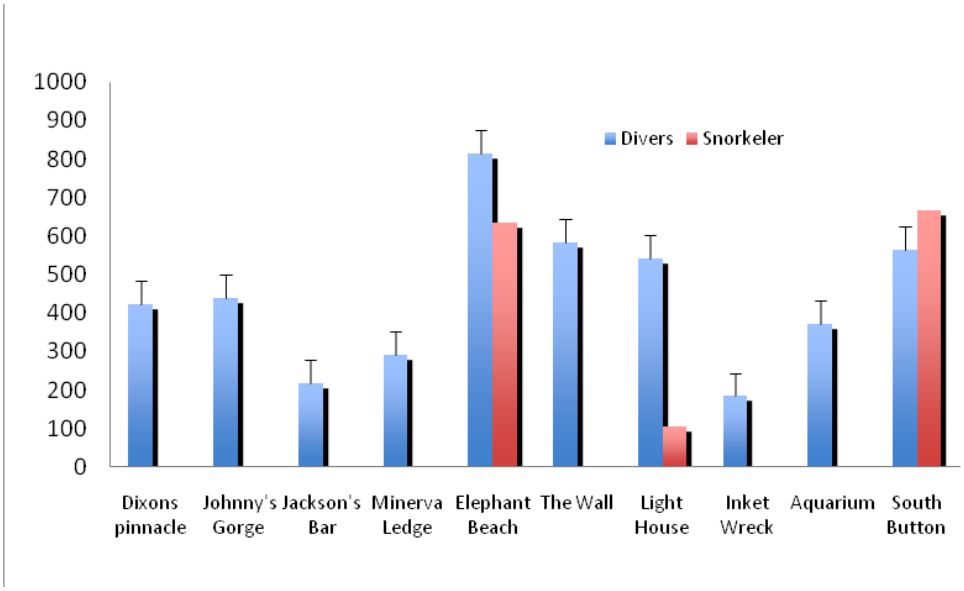
Key stakeholder groups in monitoring reef health are dive shops and trained SCUBA divers. Havelock and Neil have attracted a fair number of dive-oriented tour groups and individuals for the past decade. Diving as an activity has transformed the path of tourism in the Andaman Islands over the past two decades. Between 1993-1997, there was a single Government-operated dive shop in the entire Andaman Archipelago, with a single instructor at Wandoor, while today there are more than 9 dive shops and close to 40 trained SCUBA dive masters and instructors. While individuals employed at various outfits change from year to year, there has been considerable development which has led to competition and the discovery of new dive sites both within and beyond the precincts of the Marine Park. While the resultant competition continues to generate development of the sport, the

various shops have not been able to find work in tandem toward conservation oriented objectives. Individually most shops expressed great concern over the pace of development and potential fallouts, and do raise awareness among their clientele and with local children (2 dive shops), but they are unanimous in stating that efforts to form a constructive dialogue within their fraternity have had little success. Some dive shops were not interested in such activities or participation, while those interested have not been able to find a common platform from which Governmental support and their own efforts could benefit monitoring reef health and conservation.
While there still are some pristine reefs that are dive sites, some of the previously visited reefs have changed due both natural events and human influence. Storm surges and sand deposition, rising sea surface temperatures, anchor damage, ghost nets and diver damage are negative consequences that all dive shops acknowledged as reasons why greater consensus and cooperation among the diving fraternity is required to both monitor reef health and work together in aiding conservation and management.

Photograph 9: SCUBA diving, among the biggest attractions in the archipelago

Dive shops at Havelock and Neil are ideally suited stakeholders who have great potential to monitor and influence the management of the reef both within the marine park as well as beyond the park in locations that they use for recreational SCUBA diving. Four (three from Havelock and one from Neil) dive shops agreed to share dive log data, while others were skeptical or chose not to participate. Overall participation at various levels was part of the design toward developing a monitoring mechanism using the very same stakeholders to monitor changes to the reef and well-being of local livelihoods and businesses. Additionally, it is important to remind ourselves that this project focuses

on basic socio-economic information, while biophysical information and monitoring ideally need to be conducted by marine biologists with established monitoring protocols and resources.
The initial datasheet was designed to generate basic biophysical and dive log information, but this was dispensed with once we realized that the effort was not going to be put to use, given the lack of any agency or method by which it could consistently be used. Additionally, even though these four dive shops were willing to share such information, we wanted to test the process, rather than the kind of information that could come out of such an exercise. Eventually we settled on generating a continuous data set of basic dive log data, for which sufficient data was not available from all dive shops. One long data set (October 2010 to May 2011) from one dive shop is thus presented to describe visitation to various dive sites by both snorkelers and divers thereby producing intensity of visitation at various sites. This shows two things. Firstly, the method is possible if consistent effort toward this facet is maintained by a third party. Secondly, such data (much more than what we have collected as part of this exercise, including biophysical information on the health of the reef) needs to be used to generate a better understanding of the reef as well as to influence managerial capacity positively. Without these two aspects, such a monitoring mechanism will fail and generate negative feedback from participants and will be of no use to reef and park management.



Graph 19: Sample of dive site use over 8 months by visitors

Snorkelers form another important group who use the reef, and though most snorkelers with dive shops are given sufficient instruction on best practices while viewing the reef, on Havelock unprecedented damage has occurred to reefs in near shore waters especially at Elephant beach. The groups visiting this site in particular over the past 3 years are largely those on' leave travel concession', and visit as clients of local boat operators from both Havelock and Wandoor. Immense damage has occurred to this reef in particular due to large numbers of visitors playing in the water and churning sediment onto nearby reefs as well as unregulated speed boat traffic that transports these tourists in large numbers to and from the jetty. More than 40 boats operate at this one location on a daily basis through the main season with no regulatory mechanism in place to control

these large numbers of visitors as well as educate them on the existence and sensitivity of the reef. This needs serious attention on Havelock Island.

11.Resorts- a brief profile

11.1 Overview:

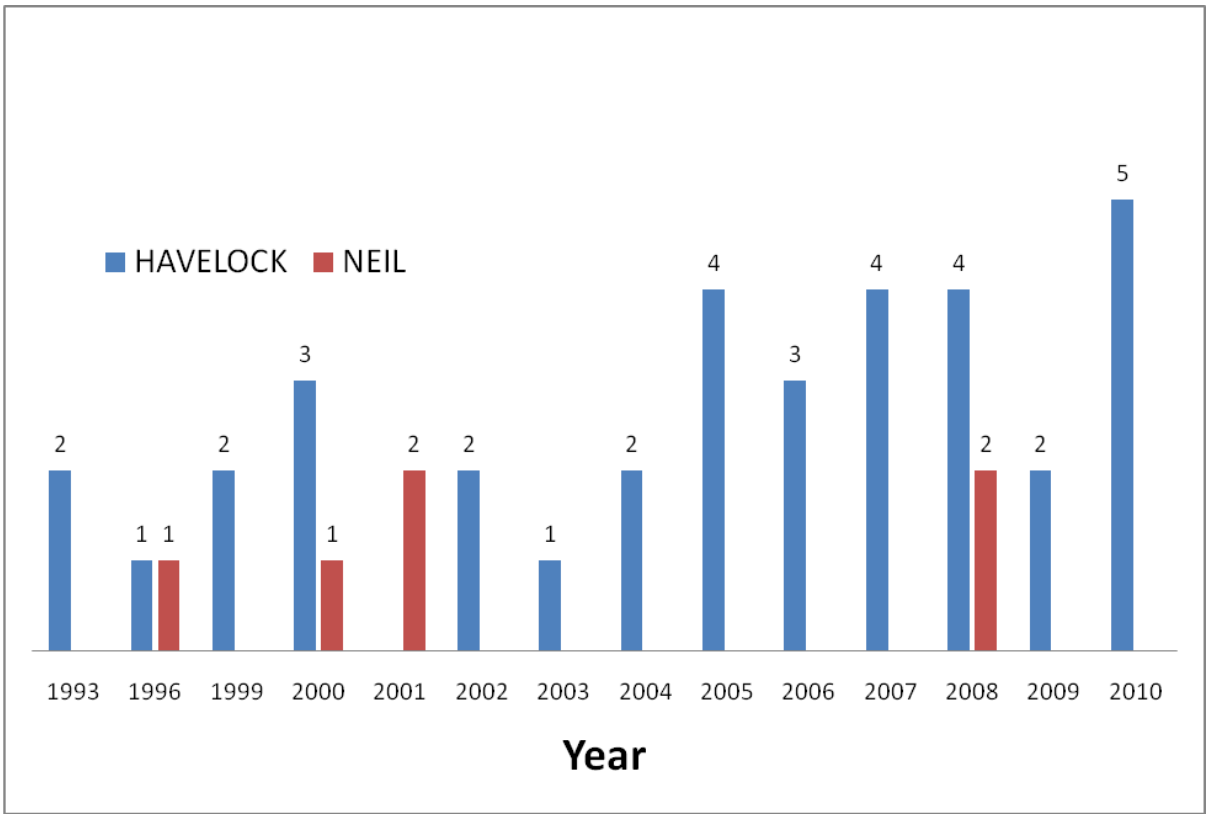
Thirty-five resorts on Havelock Island and six resorts on Neil Island were profiled for various attributes focusing on activities and facilities offered, those preferred by travelers, markets accessed by resorts, and waste disposal. There is continuous change and development at these resorts from season to season and this should be kept in mind when comprehending this data. The first resorts/rest houses developed on Havelock were Government run guest houses run by the Department of Tourism in 1993. The first private enterprise was called 'Jungle Resort' that was later changed to 'Barefoot at number 7', which to this day remains a high-end resort. This was established in 1996 with the initial tourism boom and set standards for other entrepreneurs and tourism enterprises that developed on the island, while on Neil Island the first two resorts began in 2001. The years afterward saw the establishment of a resort every year on Havelock while in 2008, cashing in on the changed attitude and incentives of the Andaman Administration, many more resorts were opened.

Categories of resorts on Havelock and Neil Islands:

Budget -27, Mid-range7, High-end 7

Photograph 10: Resorts try to use local material to blend in with surroundings. A few newer resorts are in complete contrast with concrete, glass and bright paint

These incentives came along with the need to increase tourism revenue and also spur development, given a lull in tourist arrivals immediately after the tsunami of 2004. On Havelock Island, a majority of the resorts are located along the east coast as beach front land was purchased from settlers given the existence of coconut groves and white sandy beaches with reef and shoals offshore.



Graph 20: Establishment of resorts on Havelock & Neil Islands- a time line

These resorts accommodate between 1000 to 8000 visitors each year. Snorkeling is the most preferred activity of visitors and is also offered by most resorts. Diving as an activity follows both as a preferred activity and as an offered activity even if they do not have in-house dive shops. The following table describes responses by managers of 41 resorts on activities offered and those they perceive are preferred by their clients. Here again, water based activity is the preferred activity in comparison to others.

Table 5: Perceived activity profile of visitors at resorts

Activities offered	*No: of resorts (n=41)*	*Activities preferred*	*Perceived preference (n=41)*
Snorkeling	22	Snorkeling	26
Diving	12	Diving	18
Arrange activities on commission basis	11	Beach visits	8
Game fishing	8	Fishing	3
Fishing	8	Game Fishing	3
Trekking	5	Trekking	3
Gen. tours	4	Glass bottom boat tours	2
Kayaking	2	Night fishing	2
Bird watching	2	Elephant rides	1

Glass bottom boats tours	1	Massage	1
Boating	1	Elephant interaction	1
Yoga	1		
Elephant interaction	1		

While this data was generated by visits by our team in conjunction with managers at the various resorts, what did not emerge from the survey but is evident on both Havelock and Neil Islands as the most preferred activity by a majority of 'day visitors' is spending time at a beach. Beach visitors who constitute this observed large number are largely the 'leave travel concession' tourists from government services. Visiting beaches for photographs and enjoying the sand and sea is almost ritualistic and goaded on by travel agents who cater to this category of tourist. They visit for a day or two, and avail of 'package tours' arranged by travel agents. This is a well-organized activity in generating commerce, but poorly regulated regarding its impact to the environment. The resources that are commanded and disposed of is not easily available but are exacerbated by the large group who do not show up much as data from resorts or elsewhere to provide a better picture of resource use and consumption patterns.

11.2 Waste disposal:

Disposal of waste has been a persistent problem on Havelock that is being slowly tackled and in need of much more regulation and coordination. While we skimmed the surface of the problem while gathering information from resorts, it needs separate data and a dedicated research and solution plan. As mentioned previously in this report, there have been many instances of private resorts, the police department, the *panchayat* and concerned visitors known to periodically clean beaches of plastic waste such as bottles, wrappers and pouches of packaged foods and condiments that are among the paraphernalia of most tourists. A disturbingly low awareness of sensible waste disposal is prevalent among most tourists, while consumption of articles with disposable packaging as mentioned earlier is on the increase by all categories of tourists. Resorts have independently tried to tackle this problem, but to no avail. One resort manager showed us close to 300 kg of plastic waste collected in 4 days from the Radhanagar beach. A data sheet with entries of garbage collection from 13-04-2011 to 31-01-2012 totals to 1242.00 kilograms of plastic waste collected from Radhanagar beach alone. This is a growing problem that needs deeper attention with viable and sustainable solutions that will positively impact both tourism and the future of coral reefs and marine life.

Table 6: Sewage disposal

Type	*n= 41*
Soak pit	11
Septic tank	30
Natural drainage	4
Tank	35

Table 7: Garbage disposal

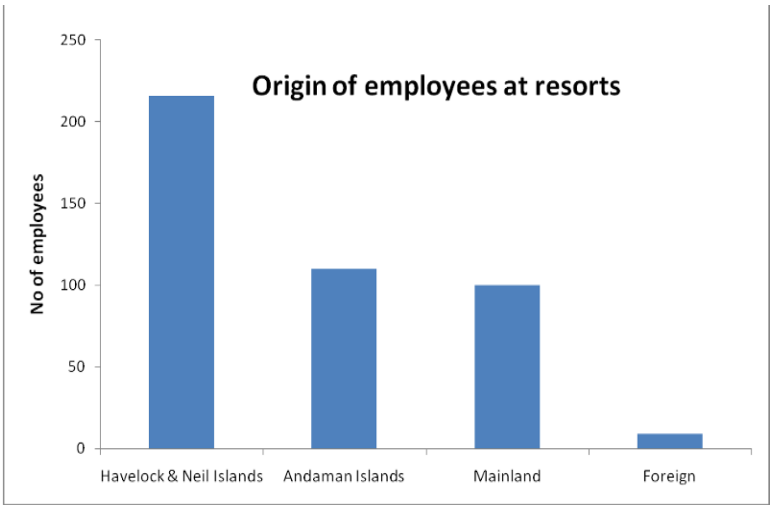
Type	*n= 41*
Soak pit	2
Burn	16
Store plastic at resort	6
Compost pit	4
Island dump site	22
Private dump pit on site	4
Food waste sent to piggery	2
Plastic transported to Port Blair	2

Table 8: Water sources and drinking water supply at resorts:

Water sources	*n= 41*	*Drinking water sources*	*n= 41*
Ring Well	27	Filtered	25
Tube well	9	Bottled	34
Pond	5	Piped supply	5
Piped supply	4	Reverse Osmosis plant (pvt)	4
Tank	1	Spring water	2
Check dam	1		
Spring	1		

11.3 Employment:

While the number of islanders (Havelock and Neil) who are skilled is low, there is a growing number of those who are being trained in SCUBA and as snorkeling guides. A large number of *Karen* men of Burmese origin, but settled in the Andamans, are employed in the SCUBA and water sport activities, which has seen increased demand by visitors over the years. The *Karens* are known to be skilled skin divers, which make them ideal guides for visitors in water sport. A profile of the origin of those employed at resorts is below. Mainlanders are owners, managers and also staff at the various resorts. Nine foreign nationals work as managers and SCUBA instructors at some resorts



Graph 21: Origin of employees at resorts

12.Conclusions and suggestions

Among these various stakeholders, we consolidated information to create basic profiles of each group, while scoping for the best options of inclusion in monitoring health of the reef as well as the tourism industry. It is obvious that with regard to the health of the reef, perceptive as well as objective measures by which reef health may be understood are best conducted by groups of researchers in marine biology, divers/snorkelers and fishermen in coordination with the Forest Department.

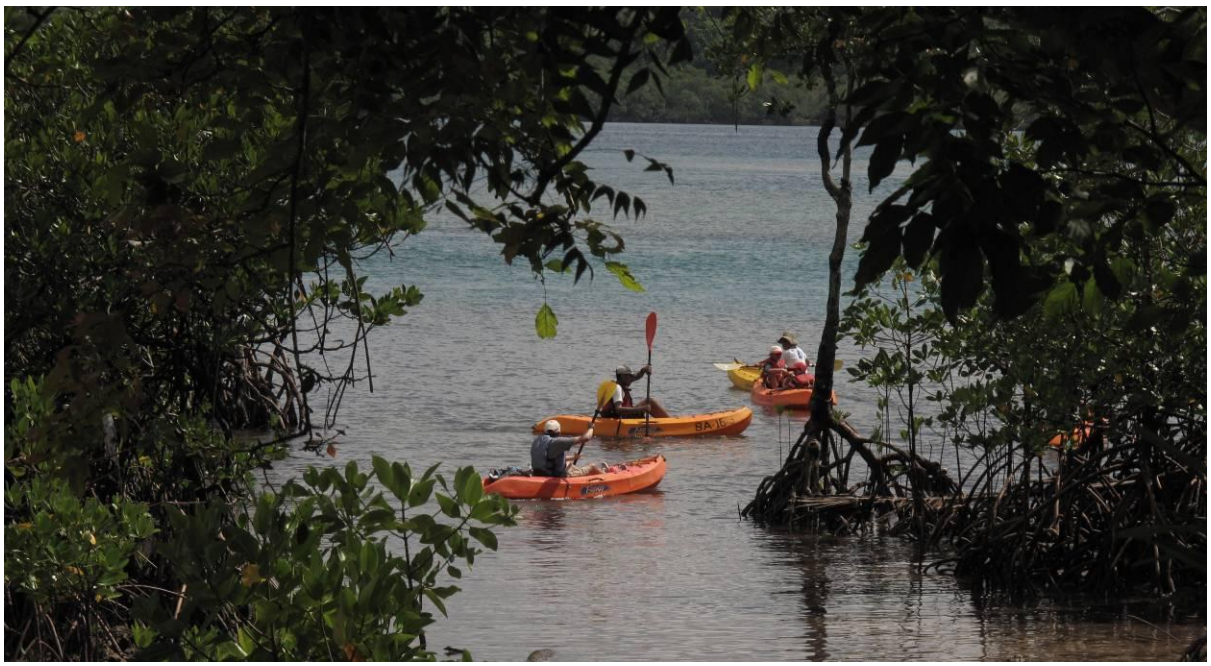
With the boom in tourist industry, the tourism department lacks capacity at either of these two islands, while village personnel, tour operators and resorts are those groups who will be able to collect and maintain data bases with regard to growth and/or decadence in their economy. Despite these notions, the SocMon exercise provide us with results that do substantiate the need for increased public participation in forming regulations and monitoring, alongside governmental departments, as each require the cooperation of the other to facilitate long term and sustainable beach and reef based tourism.

12.1 Local trends in reef use and dependence:

Coral reefs around the Andaman Islands are used by various groups of fishermen for commerce. Trends in the kind of fishery have emerged over time ranging from subsistence fishery and near shore fishery, to sea shell and sea cucumber fishery to more recent developments of fish export and targeting grouper species in particular for south east Asian markets. A significant turnaround has occurred over the past five decades with the fishery in the Andamans especially, such that the opening up of export potential has had ramifications locally. It has contributed to increased incomes for fishermen, while also resulting in increased prices for local consumers and thus bringing antagonism to this trend of development.

What these trends indicate is that the fishery in the islands has moved opportunistically ever since export markets with sea shell and the illegal sea cucumber trade took shape for more than three decades from the early 1970s to the late 1990s. Similarly, the present export markets for groupers

and other targeted species has ramifications for the management of marine parks such as the Rani Jhansi Marine National Park (RJMNP). The first is of over-exploitation of the fishery resource especially from reef areas given the species that are being targeted today. Removal of predators such as groupers in such large numbers will have ecological effects on the reef ecosystem that a biophysical assessment will be able to determine. This will need closures of regions within the RJMNP for preservation, while conservation areas can be created where use of the region can continue through a process of participatory monitoring involving stakeholders willing to join hands in managing a common natural resource.



Photograph 11: Kayakers at Havelock

12.2 Management of the marine park incorporating local communities:

Our experience from SocMon conducted at Wandoor about a decade ago exemplifies some of this; while incorporating some recommendations from SocMon in the ensuing years beginning from 2000, increased interaction with the management authorities and the local fishing community has paid dividends. The interaction was through a consultative process toward achieving consensus on the need for fish landing sites at two locations bordering the Mahatma Gandhi Marine National Park at Wandoor and at Guptapara village as well. An ice plant for fish storage was also debated, and such exercises did have a positive influence on the relation between the fishing community and park authorities. What has not happened, that went beyond SocMon, was benefit sharing of revenues generated through tourism at the park with local communities. Even today only a small number of local villagers are beneficiaries from the economy of the park. In Havelock and Neil, this is not the case. Our data shows that local benefit is on the increase both directly and indirectly, though given the economics of scale, widening income gaps are also on the increase.

The three primary stakeholder groups that have emerged from this SocMon exercise in Havelock and Neil are groups such as Fishermen, Dive operators, and Resorts. Of these three, only fishermen are from the local community, while locals are employed in the other two stakeholder groups and but seldom direct owners. The local communities of villagers are thus intermediary and benefit from the economy of tourism through such stakeholder groups. Among these stakeholder groups, a common refrain was of potential alienation from the use and management of the region that has been demarcated as a Marine Park which could result in lack of cooperation in aiding the management process of a vast region. Also, antagonism between user groups was another aspect brought up by both fisher folk and dive operators of differing use patterns of the same reef resource. While fishermen use coral reefs and marine regions to harvest and exploit fish for income generation, dive operations use the same or similar regions for recreational diving and income generation. The dependence on the reef is thus contrasted by extraction and preservation, though what needs to be recognized is that both these groups do not actively protect or manage reefs. They are used as a common resource without facilitating its management through collaboration as multiple beneficiaries/consumers. Consensus among the groups also varies. Though we have identified these economic ventures, dive operations also compete with one another and thus are not necessarily protecting the interest of the group inasmuch as protecting self interest. Additionally another aspect is of personnel involved in dive operations being dynamic, with rapid changes in which shop they work for.. In contrast, fishermen who are from the islands and are a constant fixture remain a vital group. Having contrasted these two stakeholder groups, it is important to state that from the four dive shops we interacted with, all instructors were of the opinion that it was important for them to work together for long term benefits as well as to elicit support of the fishermen in conserving the reefs. No process of dialogue between these groups has occurred so far.
This is eminently possible and has great potential for development of sustainable reef management if accepted by all concerned including management authorities such as the Andaman Forest Department and other related Departments from the Andaman Administration.

With fisher folk, another issue with regard to management of the park is of ownership of the reef against fishers from regions beyond Ritchie's Archipelago. Some of the older generation of the group were antagonistic to the exploitation of marine resources from this region by other fishers and skin divers who are recent entrants given the emergent export market and grouper/lobster trade. Resources which they have a sense of ownership over being exploited for gain by others is not seen positively. Even though they were angry about their potential exclusion from a resource they have been using for the past four decades due to the formation of a Marine Park, they pointed out that by being original users of the region they would be happy to be part of monitoring the park and regulate activities of 'other' fishermen from the Port Blair region and Mayabunder who use more advanced techniques, some very exploitative. They were happy to be part of an enforcement body to monitor intrusions into the park, as well as to continue benign methods of fishing that they claim have not affected reefs. They do acknowledge occurrences of gill nets wrapping around reefs when strong currents push them away from their anchorage. A common refrain from other stakeholders is that fishermen are irresponsible and the fishermen counter this saying that it is expensive to lose a net (and re-invest large sums to replace it) to a reef and thus these should be seen as accidental and not irresponsible behavior. Such issues may be seen as contentious from a management perspective of integrating local communities in managing natural resources, but the fact remains that by

excluding such positively inclined stakeholders such as fishermen, dive operators, the local islander community and resorts, the management of the RJMNP will suffer antagonism and non-cooperation due to the dominant exclusionary practice; in contrast the more recent practice in other regions of the world of adaptive management, by including relevant stakeholders as part of a conservation mandate has proven a way forward.

12.3 Incorporating context in planning and management- learning from SocMon:

This work was conducted in an effort to provide basic socio-economic information to management authorities in the Andaman Islands as part of a global effort to both understand and adapt to socio-ecological change that is prevalent in coastal areas worldwide. The emphasis has been on communities living along side coral reefs which are part of Marine Protected Areas (MPAS) which are both used by various stakeholder communities as well as assigned as conservation areas. Ecological and sociological research are both necessary tools that can provide managerial frameworks within the guidelines of conservation objectives for such parks. The management authorities of the Rani Jhansi Marine National Park are in the process of creating a management plan, which this work will feed into as well. Given the context that we have tried to briefly provide though this report, it is evident that local stakeholder groups are in the process of determining pathways forward. Given the dynamism experienced over the past decade, fallouts of unregulated tourism as well as the concern of potential exclusion of such stakeholders in the management and use of the Marine National Park, it would be wise to revisit exclusionary process in favour of methods that elicit cooperation of local partners. Through this work, it is clear that socio- economic conditions prevalent in this region need to incorporate a periodic monitoring program to both understand changing socio-economic conditions as well as biological health of the reef for its long term use and conservation.

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Annexure 1: Minutes of the SocMon meeting held at the Forest Department, Havelock on 27/11/2010

A meeting was held at the Divisional Office, Havelock Forest Division on the 27th of November 2010 to inform the local authorities and stakeholders about the SocMon project and introduce the SocMon team. SocMon, a socioeconomic study of reef stakeholders in Havelock and Neil Islands, has been initiated by the Andaman and Nicobar Environmental Team (ANET), which is the local partner.

This meeting was attended by the following representatives from Government departments, Panchayats, civil society, and resorts:

1	Mr. B.P. Yadav - Divisional Forest Officer
2	Mr. B. Saigal - Dy. SP, Havelock Police
3	Mr. Rajesh Kumar - Supdt. of Fisheries
4	Ms. Abita Bachchan – SHO, Havelock Police
5	Mr. Ranjan Samadar - Pradhan, Govindnagar
6	Ms. Sagarika Majhi - Up Pradhan, Govindnagar
7	Ms. Abala Samadar - Zilla Parishad, Govindnagar
8	Khagen Bepari - Up Pradhan, Shyamnagar
9	Mr. Suren Jaidhar – Deputy Ranger
10	Mr. Robin Paul - Forest ranger
11	Mr. Basudev Samadar - Forest ranger
12	Mr. Vinod Kumar - Principal
13	Mr. Bidesi Roy - Fisherman
14	Mr. Sanjit Dhale - Fisherman
15	Mr. Mohd. Ashraf - Wild Orchid Asst. Manager
16	Mr. Samuel Andrew – Head Forest Guard
17	Mr. S.C. Roy - Veterinary Department
18	Dr. Ashok Pal Gobind – Medical In Charge Primary Health Centre

The SocMon team consists of the following people:

1	Dr. Vineeta Hoon -SocMon Regional Coordinator	9444368457
2	Mr. Manish Chandi - ANET SocMon Coordinator	9474246943
3	Ms. Ruhi Deol – ANET	9679541937
4	Ms. Riya Shetty – Seacology	9679864231

After a presentation by Dr. Vineeta Hoon, SocMon Regional Coordinator, on what SocMon is intended for and another by Mr. Manish Chandi, SocMon Site Coordinator, on how it is relevant to the islands of Havelock and Neil (both presentations given as annexure), there was a comprehensive discussion by the authorities present about Havelock's people and their dependency on available marine and coastal resources. A few relevant points emerged from this discussion, which are as follow:

- It was pointed out by fisherman Bidesi Roy that the laws for fishermen were skewed, as the demarcation of the Rani Jhansi Marine National Park (RJMNP) had led to problems with passage of their boats, particularly during bad weather. He also believed trawler fishing was destroying local livelihoods as well as the supply of small fish for the island, not to mention bulldozing the seabed and endangered species with it. In addition, non-locals were encroaching on local fishing grounds and hijacking local tourism opportunities without reciprocation. He was reassured by Mr. B.P. Yadav that innocent passage was given to all fishermen within the park, as long as they were not indulging in illegal activities, landing on islands, felling trees, or fishing within the park. He also announced that any trawler fishing within the area should be reported and even if one endangered species or piece of coral was found, immediate action would be taken.

- Mr. Saigal, Dy. SP Havelock, was concerned about the damage that could be caused to the reef by the proposed Port Blair-Havelock seaplane as well as the vehicle ferry jetty that was being constructed, leading to effluents and material being dumped into the sea. He also confirmed the full cooperation of the police in tracking down and apprehending offenders/poachers and fishermen using trawling net within prohibited zone.

- Mr. Ranjan Sammadar, Pradhan of Govindnagar, and Ms. Abala Sammadar, Member – Zilla Parishad, also pointed out that loans were no longer being given for dugout engine dinghies or fibre glass boats, thus disabling the youth of Havelock and Neil Islands from being able to earn livelihoods. In addition, the Government order banning dugout engine dinghies in favour of fibre boats for tourism would render a lot of tour and snorkelling operators obsolete. Without any loans to buy fibre glass boats, a large part of household income would no longer be available. Additionally, Havelock would have the serious problem of a large number of unemployed youth.

- Mr. B.P. Yadav explained once again the need for the RJMNP and its use as a sort of saving account for fishermen. Coral reefs are the breeding grounds for edible as well as ornamental fishes. The park had to have extensive restrictions which were the only way that the population of different species that are vital to the coastal ecosystem is maintained, thus benefiting fishermen and their children in the long run.

- Many, especially the PRI members, felt that the lack of a single overarching authority/administrative officer stationed at Havelock led to a lot of problems in management. This idea was echoed by many others from both Government departments and local people.

In conclusion, all present agreed that the need for consolidated information/creation of database as per this project was essential and expressed to extend their full cooperation to the SocMon team in the coming months. The DFO also felt that the final report would provide valuable inputs for preparing management plans for RJMNP with the eco-developmental activities at Neil and Havelock Islands as well as conservation plans for the Dugong. Representatives of the Police and Fisheries departments extended their full support and promised to provide any secondary data the team may need. The meeting ended on a positive, motivating note for the team and all the stakeholders involved. Mr. Yadav thanked all the participants for giving their valuable time and input to help launch the project.

Compiled by Ruhi Deol, ANET

- Socioeconomic Monitoring for Coral reef areas in south Asia
  SOCMON SA
- Vineeta Hoon
- vineetahoon@gmail.com
- Session Structure
- What is SOCMON
- It is a set of guidelines for establishing a socmon at a marine management site. GLOBAL Programme - GCRMN started in 1998
- Coordinated by NOAA since 2008
- Regions with guidelines ready: SEA, SA, WIO, Pacific Islands, Caribbean, Central America
- Comes with Some funding from NOAA Coral reef program.
- To be linked to MPA Management
-
- SOCMON Coordination
- Global Coordinator - NOAA
- Regional Coordinators
- Country coordinators
- Site coordinators

Why do we need to do this

- Coastal Resource managers realise that coastal resources can no longer be managed from a biophysical focus alone. Community attitude towards and uses of the resource are equally important.
- Eg a marine protected area is being suggested to protect target species or threatened habitat. The fishing community is worried about losing access and income. by monitoring local perspectives and dependence SOCMON can help in identifying who will be affected and plan for them. Involving the community in making decisions will help build trust and compliance with rules and regulations
- Learning about people's perceptions and dependencies on the coastal/marine resources

2. Developing Monitoring Framework includes

- understanding the community context
- Management objectives and community perceptions
- Selecting key variables and defining the process to conduct socioeconomic monitoring
- identifying and consulting with stakeholders

- keep a special note on the Poor/subsistence users
- Conservation
  Map showing Areas for Protection at Minicoy by JCRMC

- Socioeconomic Monitoring provides the basic information for the establishment of Community need based programs.
- With regular socioeconomic monitoring we can note changes taking place in people's perceptions towards both livelihoods and conservation
- Recommend/establish programs for maximum impact.

Qualities of a good Socio economic research programme
- Accessible to the community as well as outsiders;
- Low on development resources – particularly the time and efforts of field workers and community members
- Updated reliable and relevant information;
- Simplified / easy to understand;
- Transparent;
- Reflects and responds to culture, religion and social norms.
- What role can SOCMON and play in Policy
- Creating resilience to shocks and trends
- Implementing Policy
- Informing Policy
- SOCMON
- Understanding of the socioeconomic parameters of coastal ecosystem management is an issue that is emphasized in national policy in most of the countries.
- Implementing policy:
- Generates knowledge, increases capacity & changes behaviour to support policies in:
- Conservation/sustainable resource use
- Poverty reduction
- Economic growth
- Employment
- Domestic food security
- Mainstreaming gender
- Empowerment of communities and individuals
- Informing policy:
- SOCMON
- Knowledge of resources
- Knowledge of people and institutions
- Needs and perceptions of communities
- Plans for the future
- Information on impacts of change
- Thank You

Annexure 2 (Questionnaire for village survey)

Date:

Panchayat & Village name/ward no:

1. Head of household

2. House type-(a) Cement, (b) Cement + tin roof, (d) Wooden/bamboo+ tin roof, (e) wood/bamboo + thatch roof

3. Do you own a dinghy/boat?

4. Do you go fishing with others? –regular or once in a while?

FISHING METHOD	Regular	Rarely
hook & line		
cast net fishing (khewla jaal)		
gill net		

HOUSEHOLD SIZE AND EDUCATION

Males	age	Education level	Females	age	Education level

INCOME SOURCES

Male	Employment	Female	Employment

EMPLOYMENT types	Regular	Seasonal
Govt. job (Permanent job)		
Govt./Pvt. Contract work (DRM)		
Tourism-Dive shop, boat, snorkel guide, auto, taxi, restaurant, hotel, lodge, house rent…specify		
Sale of fruits/vegetables		
Sale of coconut/supari		
Shop- pan shop/veg/general/cloth etc		
Sale of fish		
Sale of poultry		
Sale of goat		
Any other source (specify):		
Any family member works outside of the island to earn income?		

Estimated total annual cash income of household:		

LAND USE	Hilly	Paddy	House site
Settler			
Legal heir (No :)			
Migrant			
Area			
Crops grown			
Any other use of land			
Any land sold			

5. Do you use pesticides or fertilizer (chemical) for agriculture?

6. Which pesticide or fertilizer have you used and for how many years have you used them?

7. What is your source of water? [tick as many sources used regularly]

   (a) well (b) pond (c) piped supply

8. Fish purchase [how many times a week?]

9. Which are the households most favored fish? (give local name/s)

10. For how many months do you buy rice?

11. What fuel is used in the kitchen- Gas cylinder, kerosene, firewood?

12. How many chords of firewood are needed per year?

13. Rank timber resources important to maintain livelihood?

Rank between 1-5 (5 = highest rank),0=not used at all

Forest resource	Rank
Sawn timber	
Posts	
Poles	

Thatching leaves	
Chattai bamboo	

14. Are coral reefs important? .....for what?

15. What are the improvements you consider important for island development?

Annexure 3 (Questionnaire for fisher survey)

1. Name:
2. Ethnicity:
3. Village & ward no:
4. Family size/no. of dependents:

Adult Men	Adult women	Young male	Young female	Child

5. Level of education of family & self:

Adult Men	Adult women	Young male	Young female	Child

6. Licensed fishermen or not:
7. No: of boats owned
8. How many years have you been fishing? :
9. Agricultural land owned? :
10. Are you or any of your kin engaged in agriculture for income or subsistence?
11. Are the women of your household involved in selling fish?
12. Have you been able to earn money through snorkel tourism?
13. Any other income generating activity over the year/seasonally?

Season	Activity	No: of people engaged
Monsoon		
Summer		

14. In which areas have you most frequently seen whales, dugongs, dolphins, crocodiles or any such charismatic species while fishing?

Species	Areas
Whale	
Dugong	
Dolphin	
Crocodile	

15. What areas do you fish in, at what time of year and what kinds of fish are caught? :

Areas	Bait	Types of fish caught (Local names)

16. Rank or tick preferred fishing regions-also indicate preferred catch from each region/habitat: (Rank 5- highest, Rank 0- no use)

HABITAT	Rank	Preferred catch
Open Sea		
Channels		
Off the reef		
Mangroves		

17. What gear do you use to fish? (Rank in terms of frequency of use):

GEAR	Hook & Line	Gill Net	Cast Net	Spear Fishing	Other (specify
RANK					

18. What are your major household expenses?

19. What is your yearly average family income?

20. How could you be involved in helping manage the Marine Park?

Annexure 4: (Data for resort survey)

Resorts of Havelock & Neil Islands:

Data collected to generate a profile of resorts:-

- year of establishment
- location
- tariff
- facilities offered
- activities offered
- activities most preferred
- staff profile
- highest annual expense
- fish source meat and vegetable source
- water and electricity source
- sewage and garbage disposal
- drinking water supply
- water craft