

**Sustainable Ecotourism and  
eco-enterprise opportunities in the  
Gulf of Mannar, Tamil Nadu, India.**

Report of a study conducted

5 - 20 February 2002

on behalf of

**M.S. Swaminathan Research Foundation**

By

**Naomi M. Saville**

Freelance Consultant in Participatory Grassroots Development

Contact address: GPO Box 9875, EPC 1514, Kathmandu, Nepal. Tel +977-1-560015

e-mail: [naomis@wlink.com.np](mailto:naomis@wlink.com.np)

**For further information about the Foundation and about its work on pro-poor tourism contact**

Prof. P.C. KESAVAN

DAE-Homi Bhabha Chair & Executive Director

M.S. Swaminathan Research Foundation

Taramani Institutional Area, CPT Campus, Chennai 600 113, INDIA

Tel: +91-44-2254 2792 (Direct); 2254 1229, 2254 1698, 2254 2698; Residence: 2246 0254, 2246 0077

Fax: +91-44-2254 1319

Email: [pckesavan@mssrf.res.in](mailto:pckesavan@mssrf.res.in), [mssrfed@vsnl.net](mailto:mssrfed@vsnl.net), [executivedirector@mssrf.res.in](mailto:executivedirector@mssrf.res.in)

The **M.S. Swaminathan Research Foundation** (MSSRF), Chennai is harnessing science and technology to solve the serious ecological and social problems MSSRF has defined its research agenda in terms of **sustainable development**, rooted in the principles of ecology, social and gender equity, employment generation, and economic viability. The fostering of a **pro-nature, pro-poor, pro-women** and **pro-employment** orientation to technology development and dissemination in rural areas is MSSRF's mission.

In the field of agriculture, MSSRF is transforming the “**green revolution**” into an “**evergreen revolution**” based on sustainable advances in biological productivity.

The excellent set up of **genetic engineering and biotechnology** unit in MSSRF has enabled the transferring the **salinity tolerance** genes from a wild mangrove species, *Avicennia marina*, to cultivated varieties of rice, black gram and mustard. This is a part of our anticipatory research programme to mitigate the problems of the adverse effects of rapid salinisation of our coastal soils and water on account of sea-level rise due to **global warming**.

Our Foundation has also been a pioneer in using **Information and Communication Technology** for poverty alleviation in the rural and tribal areas of several parts of Tamil Nadu and Orissa. Recognizing that India is one of the **mega biodiversity** centres of the world, we have generated several mechanisms that link livelihood security of the tribal and rural women and men with the ecological security of the region. Our Foundation is among the foremost to recognize that **food availability** alone does not ensure food security at the intra household level and there is need for generating economic access (purchasing power) to ensure food security. In order to enhance the food security at the intra-household level our Foundation has been developing paradigms and models, which enhance the rural livelihood base, e.g. Biovillages, Rural Knowledge Centers, which have been set up in several villages of Pondicherry, Tamil Nadu, Orissa etc.

**Sustainable Ecotourism and eco-enterprise opportunities  
in the Gulf of Mannar, Tamil Nadu, India.**

**Table of Contents**

EXECUTIVE SUMMARY.....	5
1 Introduction - context.....	10
1.1 The Gulf of Mannar and threats to it's unique biodiversity .....	10
1.2 Work currently being undertaken in the Gulf of Mannar .....	10
1.3 Importance of multi-stakeholder community-based fisheries management .....	10
1.4 Tourism and its impact upon the poor and the environment.....	11
2 Aims of the study.....	12
3 Limitations of this study .....	13
4 Methods .....	13
5 Itinerary .....	14
6 Stakeholder analysis.....	15
6.1 Interviews with stakeholders.....	16
7 Discussion of potential ecotourism products and eco-enterprises arising from the field study .....	17
7.1 Description of each product / enterprise for the Gulf of Mannar .....	17
7.1.1 Descriptions of Educational tourism products .....	17
7.1.2 Descriptions of Religious tourism products.....	19
7.1.3 Descriptions of Nature / Leisure Tourism products.....	20
7.1.4 Descriptions of Eco-enterprises.....	23
8 SWOT analysis for each of the different tourism products and eco-enterprises.....	26
9 Analysis of General Barriers to Ecotourism and Eco-enterprise in the Gulf of Mannar.....	42
10 Prioritisation of potential ecotourism products and eco-enterprises .....	50
11 Conclusions.....	59
12 Recommendations.....	60
13 References.....	64

## Acknowledgements

I would like to express my sincere thanks to:

- Professor M.S. Swaminathan and the MSSRF for welcoming me to work with them on this study;
- Dr. Sudha Nair for initiating contact and for ongoing support
- Ms. Suchitra Padmanabhan of MSSRF for invaluable assistance in all phases of this study;
- Dr. V. Selvam of MSSRF for excellent hospitality and management of field activities at very short notice;
- Mr. Prahalathan of Dhan Foundation for organising the day trip to Nallathanni Island;
- Ms. Sangeeta of Dhan Foundation in Mandapam and all the members of the Mugavai Federation of Self Help Groups who gave up their time to interact with and welcome me;
- Mr. Selvakku of MSSRF for providing orientation and organising field activities before my arrival;
- Mr. Ganesh of Department of Fisheries for giving up valuable time to talk and for allowing us access to Krusudai Island;
- CMFRI for allowing me inside the gates and to see around some areas;
- Swami Pranavananda for an illuminating discussion and to his school students and ashram assistants for a warm reception;
- All the vendors, shop keepers, hoteliers and tourists in Rameshwaram who gave up time to talk with us;
- Foreign tourist guides Mr. Dass and Mr. Edward for telling us about tourism in the area and taking us to snorkel on the reef near Sankumal;
- Fishermen / fisherwomen and members of women's Self Help Groups who welcomed us into their communities in the villages of Dhanushkodi, Sankumal (near Rameshwaram), Keehamundal (near Nallathanni Island on the mainland), Singi valla Kuruchi and Kunjarvallasai (near Mandapam);
- Mr. Steve Borgia, Mr. Sitaram and all the staff at Swamimalai resort for a royal reception and wonderful hospitality and care;
- All members of the MSSRF 'eco-tourism committee' for their inputs and encouragement namely, Dr. S. Yadava, Mr. Steve Borgia, Prof. M.S. Swaminathan, Prof. P.C. Kesavan, Dr. Sudha Nair, Dr. S. Rangaswami, Dr. V. Selvam and Ms. Suchitra Padmanabhan.

### Abbreviations used in the text:

MSSRF - M.S. Swaminathan Research Foundation

CMFRI - Central Marine Fisheries Research Institute

MORD - Ministry of Rural Development

UNDP - United Nations Development Programme

BOBP - Bay of Bengal Programme

GOM - Gulf of Mannar

TNRRM - Tamil Nadu Rural Reconstruction Movement

SHG - Self Help Group

CG - Coast Guard

TTDC - Tamil Nadu Tourism Development Corporation

## EXECUTIVE SUMMARY

The Gulf of Mannar (GOM) lies on along the east coast of Tamil Nadu state of India between the south coast of Pamban Island (site of the holy town of Rameshwaram) and Thuthukodi (Tuticorin). It is the site of a Marine Biosphere Reserve, which contains coral 21 islands and harbours an array of increasingly threatened biodiversity that has been the subject of ecological study over many years. Since mechanised boats using trawling fishing methods were introduced around 50 years ago and since populations of people dependent on fishing for their livelihoods have increased, the marine resources of the GOM biosphere reserve have come under increasing pressure. Fish, corals, sea cucumber, chanks (sacred conch shells), sea cows, marine turtles and many other resources are now declining in abundance and diversity and some species risk extinction. In this context there is an urgent need to seek alternative livelihood options for the fishing communities along the coast of the Gulf of Mannar. Ecotourism and eco-enterprises are amongst the only options available, coupled with multi-stakeholder community-based sustainable fisheries management.

The aim of this study was "*to identify suitable ecotourism products and eco-enterprises that would provide income generation opportunities for local fishers*". Primary data were collected during a 7-day visit to the GOM region by interaction with many of the stakeholders potentially involved and by observation of some of the key areas that might be developed. Secondary data were available in a number of publications and internal reports, mainly produced by M.S. Swaminathan Research Foundation (MSSRF) and the Bay of Bengal Programme (BOBP).

In the context of this report **ecotourism** refers to tourism that is *pro-poor* (i.e. that generates net economic, social, cultural or environmental benefits to the poor), *pro-nature* (i.e. ensuring sustainable use of natural resources), *participatory* and involving a *learning experience / cultural exchange* for visitors and hosts. The report looks at 3 mains kinds of tourism, namely **educational tourism**, **religious tourism** (the existing important market sector) and **nature / leisure tourism** and uses the term 'ecotourism' for the type of tourism products suggested within these categories. In addition the report identifies certain **eco-enterprise opportunities**. These may be directly related to tourism, may be oriented towards reducing negative effects of tourism or may be alternative livelihood options unrelated to tourism.

The process of analysis undertaken by this report is as follows:

- i) Make a brief **preliminary analysis of the stakeholders** potentially involved in development of ecotourism and eco-enterprises;
- ii) **Identify potential ecotourism and eco-enterprise opportunities;**
- iii) **Make a SWOT analysis for each potential product** on the basis of primary information collected from stakeholders in the field, exploring the various issues likely to influence the development of ecotourism and eco-enterprises;
- iv) **Analyse general barriers** to developing ecotourism and eco-enterprises and possible ways to overcome them;
- v) **Prioritise upon the options on the basis of estimated feasibility, environmental sustainability and poverty impact;**
- vi) **Draw conclusions and recommendations** for an **integrated process** (involving tourism, eco-enterprise and sustainable fishing practices) **of enhancing the management of the Gulf of Mannar Marine Biosphere Reserve.**

**Stakeholders** fall into the following groupings:

- Fishing community: - traditional fishers, mechanised fishers, fishers' cooperative societies, fish traders, and money lenders;
- Tourists: Tamil Nadu state tourists, other South Indians, North Indians, foreigners;
- Government authorities: Departments of Fisheries, Forests, Tourism, Coast Guard, Central Marine Fisheries Research Institute (CMFRI), Tamil Nadu Tourism Development Corporation (TTDC);
- Tourism market related: hoteliers, restaurants, vendors, travel agencies, tourist guides, boating guides;
- Development related: Women's Self Help Groups (SHGs), Federation of SHGs, Dhan Foundation NGO, MSSRF, Social workers, Swami Pravanavananda, other NGOs;
- Religious: temple authorities, mutts;
- Inter-stakeholder organisation: Multi-stakeholder Committee for the Management of the Reserve

The latter (at the time of this study) was existent only on paper, having been formed 2 years previously but never having met. Some but not all stakeholders were met with during the study, but certain key actors such as Forestry Department, Coast Guard and TTDC were unavailable. These, and all the other stakeholders with them, will need to be addressed in a much more detailed stakeholder analysis should a programme of developing the options presented here be undertaken.

In analysis of the Strengths, Weaknesses, Opportunities and Threats for each enterprise the following themes emerged:

**Strengths** included:

- the beauty of the location and its attractiveness to tourists,
- religious attraction of the area
- the scientific value of the area for biological study,
- the existence of enterprises that have already started on a small informal scale,
- old facilities that can be relatively easily renovated,

**Weaknesses** included:

- difficulties to include the poorest stakeholders;
- high costs of set-up and / or of maintenance involved in some enterprises;
- lack of safety provisions for tourists;
- lack of infrastructure such as roads, sufficient drinking water, waste disposal etc.
- lack of market knowledge;

**Opportunities** mainly included:

- existence of skills or knowledge in the local community (e.g. knowledge of marine life);
- existing small scale operations or facilities to build upon;
- interest amongst tourists;
- social mobilisation through SHGs and federation of SHGs;
- credit facilities through SHGs and Federation of SHGs
- availability of technical advice / skills.

**Threats** included:

- potential negative environmental impacts (damage to corals, pollution by sewage, motor boats, rubbish, etc.);
- lack of permission from government authorities to develop the opportunities;
- potential lack of market for products;
- potential poor management;
- potential for too many tourists (beyond the carrying capacity of the area).

**Barriers to development** of the options and the possible means of overcoming them were as follows (ranked from most significant to least significant)

<i>Rank</i>	<i>BARRIER</i>	<i>WAY OF OVERCOMING IT</i>
1	Regulations & red tape	Advocate for change in rules that prevent ecotourism and eco-enterprise from developing
2	Lack of infrastructure.	Road improvement down east coast, Sewage treatment, Drinking water systems, Improved drainage, Composting toilets,
2	Lack of human capital of the poor – e.g. skills	Training in skill development
2	Lack of social capital / organisational strength	Capacity building
2	Lack of awareness about the biosphere reserve	Awareness raising about the GOM and the biosphere reserve
2	Lack of land ownership / tenure	Relaxation of rules about needing land documents to develop enterprises on beaches.
3	Low capacity to meet tourist expectations	Awareness raising about tourism and skills training to work in the sector
3	Lack of linkages between formal and informal sectors / local suppliers	Develop village tourism with NGOs, social workers and Tamil Nadu Tourism Development Corporation assisting to make linkages. Make nodal points to bring sectors together (like interpretive centre on GOM)
3	Lack of financial capital of the poor	Credit through Federation of SHGs
3	Lack of stakeholder participation	Multi-stakeholder participatory approach to develop community-based sustainable fisheries management plan.
3	Planning process favours others – lack of planning gain	Promote participatory planning process in local government and in community based organisations
3	Intra- and inter- sectoral conflicts	Conflict resolution through expert conflict management intervention
3	Gender norms & constraints	Gender awareness raising
3	Lack of pro-active govt support	Pressure from international donors, international tourism industry and Indian pressure groups to change policy
4	Tourist safety	Safety regulations to be introduced e.g. life belts for all passengers in boats, life buoys, quotas for numbers per boat
5	Tourist market (segment) inappropriate	Market ecotourism to new sectors. Promote GOM with foreign ecotourism market
5	Inadequate access to the tourism market	Association of village tourism operators. NGOs etc to help make linkages
6	Lack of “product”	Make regulations amenable to development of products
6	Incompatibility with existing livelihood strategies	Making new opportunities so profitable that existing livelihood strategy is less necessary
6	Security issues	Relaxation of coast guard rules about non-fishing boats. Cooperation between coastguard and other boat operators
6	Location	Infrastructure development

Having made a SWOT analysis and analysed how barriers to development of the different enterprises might be overcome, **prioritisation** of the different ecotourism and eco-enterprise opportunities was conducted on the basis of **estimated feasibility, poverty impact and environmental impact**.

The feasibility index ranks are as follows:

- 5 - Feasible and highly likely to be successful;
- 4 - Probably feasible and likely to succeed;
- 3 - May be feasible and successful - needs careful analysis to find out;
- 2 - Not very likely to be feasible but the idea warrants investigation;
- 1 - Probably not feasible though the idea warrants further investigation;

0 - Not feasible at all

A 'pro-poor rating' of each product or enterprise in terms of its potential pro-poor impacts, should barriers to its development be overcome making it feasible, is also given as follows:

\*\*\* - Highly desirable (will greatly benefit the poor)

\*\* - Desirable (should provide net benefits to the poor)

\* - Acceptable (should not impact negatively on the poor but may not benefit them)

The potential environmental impact of the products and enterprise is summarised under the following categories:

A\* = very positive i.e. substantial net environmental benefits

A = positive i.e. net environmental benefits

B = neutral i.e. should have no negative impacts *if properly managed*

C = possibly negative i.e. has potential to impact negatively on the environment

D = negative i.e. will most likely impact negatively on the environment

The suggested opportunities ranked in order of preference under the 4 heading are as follows:

**i) Educational tourism**

Rank	Product or enterprise	Pro-poor rank	Environmental impact rank	Feasibility index
1	Interactive CD Rom cum Website on Gulf of Mannar	*	A	5
1	Interpretive centre on the Gulf of Mannar	*	A	4
2	Field study centre in Krusadai Island	**	B	4
3	Student conservation volunteer holidays	*	A	4
3	Oceanarium	*	B	3
4	Modernisation / upgrading of the museum & aquarium of the CMFRI	*	B	2
5	Snorkelling and scuba diving school	*	B	2

**ii) Religious tourism**

1	Package tour of religious sites	*	C	5
2	Yoga / meditation ashram in Swami Pranavananda's fishing community	**	B	5
3	Pilgrimage tours to Muniya Swami temple on Nallathanni Island	**	C	3
4	Renovation of lesser known temples and tanks	*	B	3

**iii) Nature / Leisure tourism**

1	Fish barbecues around fires on the beach	***	B	5
1	Snorkelling boat trips to coral near Sankumal village	***	B or C	4
2	Glass-bottomed boat trips to coral areas.	*	B or C	4
2	Day trips to Nallathanni, Musal (Hare) and / or other islands.	*	C	3
3	Luxury neighbourhood friendly 'eco-resort' hotel	**	B	4
3	Pearl cultivation by tourists	**	B	4
3	Turtle hatchery with tourist viewing facilities	*	A	3
4	Village tourism in Sankumal	***	B	3
5	Eco-beach resort on the road to Dhanushkodi	**	B	2
6	Eco-beach resort on mainland near Nallathanni Island	**	B	2

iv) **Eco-enterprises**

Rank	Product or enterprise	Pro-poor rank	Environmental impact rank	Feasibility index
1	E-mail & internet facility for tourists to be associated with yoga / meditation ashram.	**	B	5
1	Bicycle rental enterprise with bicycle workshop.	***	A	4
2	Small-scale low-cost solar fish driers	**	B	4
3	Palm basket making for replacement of plastic packaging	***	A*	3
3	Tailoring of cotton bags to replace plastics with tailors trained by ashram tailoring training centre	***	A	3
3	Marketing of non-plastic alternatives accompanied by area-wide ban on plastics	***	A*	3
3	Production of bio-fertilisers from hotel / restaurant and temple organic wastes	**	A*	3
4	Women's cooperatives to make tourist trinkets and materials for worship in the temple	***	B	3
4	Neem processing	***	A	3
4	Paper bag production (if possible using recycled materials)	**	A*	2
4	Apiculture - with indigenous <i>Apis cerana indica</i>	***	A	2
5	Female guides and taxi / auto-rickshaw drivers for women travellers.	**	B	2
6	Recycling enterprise, especially finding use for plastic bottles	*	A*	0 as yet

The report recommends the following:

- i) *Reactivation of the multi-stakeholder committee* for strengthening the management of the GOM marine biosphere reserve;
- ii) *Address barriers* to development through
  - building a supportive policy environment,
  - developing infrastructure,
  - raising awareness about biodiversity, GOM reserve and about tourism opportunities,
  - conflict resolution
  - skill development for stakeholders
  - capacity building of government and non-government (NGO & CBO) organisations
- iii) *Conduct further research* to access knowledge on: markets for products; stakeholders and their situations; participatory business plans for the enterprises; carrying capacity of different locations within the biosphere reserve.
- iv) In the light of the further research, *develop the enterprise options identified* in this report
- v) *Draw upon experiences of BOBP* in Maldives and Malaysia;
- vi) *Develop a Participatory Sustainable Community-based Marine Resource Management Plan*
- vii) *Implement* this plan using *participatory feedback systems* from all stakeholders to maintain it.

## 1 Introduction - context

### 1.1 *The Gulf of Mannar and threats to its unique biodiversity*

The Gulf of Mannar is located between the West coast of Sri Lanka and the east coast of Tamil Nadu state of India between the towns of Rameshwaram and Thuthukudi (previously named Tuticorin). The Gulf contains 21 islands made up of coral and coral rubble and comprises a unique ecosystem within which rich biodiversity is found. The biodiversity of the Gulf of Mannar has been studied and documented over the years, originally by the British and later by the Central Marine Fisheries Research Institute, India. Since notification of the 21 islands, surrounding waters and the nearby coast as a Biosphere reserve in 1989, the Gulf of Mannar has been the source of quite intensive study and discussion (Deshmukh and Vankataramani 1995, Anand, Dorairaj and Parida 1998, MSSRF 1998, Devaraj 1998, Kelleher 1998). The effects of pollution especially from industries in the Thuthukudi area (Easterton 1998), of coral mining (Ramanujam and Mukesh 1998), unsustainable fisheries management (Dorairaj 1998), over-cropping of economically valuable seaweed species (Kaliaperumal 1998, Madhu 1987) and sea cucumber species (James 1998) are causes for concern and urgent action if the biosphere reserve is to remain a haven for various rare and endemic species and an enormous variety of biodiversity.

### 1.2 *Work currently being undertaken in the Gulf of Mannar*

The MSSRF has been involved in seeking funding for initiatives to *Strengthen the Management of the Gulf of Mannar Marine Biosphere Reserve* since 1995 and in 1999 the Global Environment Facility (GEF) and UNDP agreed to fund a US\$ c.8 million programme through the Tamil Nadu state government on condition that matching contributions in kind were forthcoming. This programme has been slow to get underway and to date no release of funds has been possible. Since 2000 MSSRF has been operating a programme entitled "*Project for promotion of alternative livelihood options for the poor in the vicinity of the Gulf of Mannar biosphere reserve*" (MSSRF 1999) funded by UNDP and Ministry of Rural Development, Government of India. This programme, in collaboration with CMFRI is currently introducing one community-operated agar production unit and pearl cultivation to 10 poor fishing families in the Mandapam area. In the Thuthukudi area artificial reef construction and fish pickling units are also being developed. The MSSRF project works closely with the Dhan Foundation, a large Indian NGO that promotes Community Banking through Federations of Self Help Groups (small community based savings and credit groups). Dhan Foundation has been working in Ramanathapuram district (which contains many of the coastal areas along the biosphere reserve) since 1992. Dhan Foundation also promotes renovation of village tanks for community based water harvesting and conservation in drought stricken areas. The socio-economic situation of the fishing communities along the coast of the biosphere reserve has been studied by Tata Economic Consultancy Services and the Society for Social Forestry Research and Development Tamil Nadu (1998). Fishing is the main occupation especially for the landless people along the coast, whilst agriculture and palmyra working are the main occupations inland. The fishing communities in particular depend upon local moneylenders, who are often also fish traders, for survival in the lean seasons. Credit for purchases of nets, boats or other equipment or simply for everyday living expenses outside the fishing season is obtained on the basis of buy-back agreements for fish during the fishing season. Whilst the fish traders may not charge interest on the loans they provide to the fishers, the latter are obliged to pay back their loans by providing their fish catch throughout the season. This means that small-scale fishers cannot sell their fish on the open market and get very poor prices for their fish.

### 1.3 *Importance of multi-stakeholder community-based fisheries management*

Generally local people lack awareness about the biosphere reserve and the importance of conserving the biodiversity of the area. Over-fishing is a major problem. Poorer fishing communities using traditional crafts (such as *catamaran*, *vathai*, *vallam* and *thoni* with or without inboard or outboard motors) generally blame the larger mechanised boat owners, who conduct trawling, for the decrease in their catch saying that they destroy the fish breeding grounds. Consequently conflict between the traditional country boat fishers and the mechanised trawling fishers is increasing. Hence there is an urgent need for Community-based Sustainable Fisheries Management of the type described for Malaysia's national park areas (Salim 1998, Hiew 1998, Ab Rahim 2000) using 'smart partnerships' between stakeholders where a co-management process is considered legitimate by those who authorise it, those who design and implement it and those affected by it (Sen 1998). In this sense the Gulf of Mannar biosphere reserve and those involved in its management have a great deal to learn

from the experiences of the Bay of Bengal Programme (BOBP) (e.g. Yadava 2001 a, b and c, FAO-BOBP 2001) especially in Malaysia (see Salim 1998, Lim 1998, BOBP 2000, Sze et al 2000, Ab. Rahim 2000) and in the Maldives (see Nickerson and Maniku 1997). A multi-stakeholder approach involving *all* stakeholders and enabling their participation in management decisions and code of conduct enforcement should be undertaken to ensure that stakeholders view the shared resources as in their own interests to protect. The complicated multi-stakeholder issues could not be addressed in detail in this report as time was insufficient to address all stakeholders and their concerns in sufficient detail. However, as a pre-requisite to any further developments, PARTICIPATORY MULTI-STAKEHOLDER COMMUNITY-BASED MANAGEMENT OF THE GULF OF MANNAR MARINE RESOURCES MUST go hand in hand with any attempt to diversify livelihoods of fishers including ecotourism and eco-enterprise. Participatory fisheries management and development of ecotourism and eco-enterprise must be part of one integrated process to reduce the current pressure on the biodiversity of the Gulf of Mannar region. Such integrated, participatory multi-stakeholder approaches to management of marine parks with ecotourism are being successfully undertaken in Malaysia in Pulau Payar Marine Park (Lim 1998) and the Maldives (Firaag 1997). Hence it is suggested that in developing an appropriate mechanism that experience from these areas is drawn upon heavily.

#### 1.4 Tourism and its impact upon the poor and the environment

Issues around tourism and its potential for impacting positively upon the poor have been receiving increasing amount of attention. ODI and DFID of UK have stressed that tourism should be made *'pro-poor'*. "*Pro-poor tourism*" means "*tourism that generates net economic, social, environmental or cultural benefits to the poor*" (Ashley, Goodwin and Roe 2001, Ashley, Roe and Goodwin 2001). Practical strategies for pro-poor tourism have been studied in various parts of the world such as Nepal (Saville 2001, Saville 2002), St. Lucia in the Caribbean (Renard et al 2001) and Ecuador (Braman and Fundacion Accion Amazonia 2001) as well as others summarised in Ashley, Roe and Goodwin (2001).

Until recently 'ecotourism' has been a more common term than 'pro-poor tourism'. Ecotourism has been defined variously "*as responsible travel to natural areas that conserves natural environments and sustains the well-being of the local people*" (The Ecotourism Society) or "*an enlightening, participatory travel experience to natural and cultural environments... ensures the sustainable use of environmental resources, while producing viable economic opportunities for the host communities*" (University of Pretoria, Centre for Ecotourism) both quoted in Nichol (1998a). Viewed with these definitions in mind 'pro-poor tourism' differs from 'ecotourism' in as much as the former puts the poor at the centre of the tourism initiative and the latter puts the emphasis upon conservation or sustainable resource use. In fact sustainable resource use or conservation and sustainable livelihoods of poor people in areas of tourist interest are interdependent and hence for the purposes of this study the more commonly used term 'ecotourism' will be used on the understanding that this in itself will be expected to be 'pro-poor'. A pro-poor analysis will be undertaken to ensure that impacts on the poor of the Gulf of Mannar are not overlooked. Similarly although this report will look separately at educational, nature tourism / leisure tourism and religious tourism, these aspects of tourism will all be addressed in terms of their impact on the environment and upon the local population, especially the poor. Hence the term 'ecotourism' functions as an umbrella term for all kinds of tourism to be analysed in this report.

The potential for ecotourism as an economic alternative to extractive exploitation of fishery resources through fishing has been demonstrated in the Maldives where Waheed (1998) showed that the viewing value of reef sharks might be 10 times the entire export value of all shark products! Estimates showed that the combined viewing value of marine wild animals exceeds US\$ 19 million, while scuba diving alone exceeded US\$41 million in 1996. In Malaysia also the economic value of marine park tourism is enormous and a major contributor to the economy of the country.

There are environmental costs to tourism however (Firaag 1997, Lim 1998), such as:

- Construction of coastal structures that change coastal currents and resulting erosion and accretion processes, upsetting the natural balance of the reef ecosystems;
- Destruction of reefs by mining of coral rock and sand in the development of tourist facilities;
- Removal of coastal vegetation or disruption of natural succession processes during building of tourist facilities;

- Pollution from solid and liquid waste - seepage of sewage into aquifers can contaminate reefs with choliform bacteria, chemical and nutrients from polluted water may cause eutrophication and undesirable blooms of micro-organisms;
- Pollution from littering of non-biodegradable waste (plastics and tin cans) kills marine wildlife and has many other negative impacts.

These environmental costs need to be rigorously examined through assessment of the carrying capacity of different areas, as performed by Lim (1998) in Malaysia. Rigid quotas setting ceilings on development of tourist facilities, restrictions on the type of development, and quotas for numbers of visitors to any particular location over time are essential as well as effective systems of sewage disposal / treatment and litter disposal.

A thorough introduction to ecotourism and its potential in the Gulf of Mannar was prepared by Nichol (1998 a and b). This identified potential ecotourism products as Krusadai, Hare (or Musal) and Nallathanni islands and suggested a planning framework for their development. The report still has relevance and should be used as reference material in preparation of an integrated ecotourism plan.

## 2 Aims of the study

The main aim of this study was *"to identify suitable products and enterprises that would provide income generation opportunities for local fishers"* under the following categories:

- Educational Tourism** - to enhance awareness of the ecological importance of GOM and prevent unsustainable exploitation;
- Nature tourism / Leisure Tourism** (commonly thought of as ecotourism) - sustainable use of the 21 islands in GOM and areas along the coast;
- Religious tourism** - the current largest market sector which needs 'greening';

*[NB: For the purposes of this report development of new products or approaches in all three forms of tourism will be termed generally as 'ecotourism'.]*

- Eco-enterprises** - for alternative livelihood options to avoid over-exploitation of the fishery and other natural resources of the area.

Rather than repeating the investigations of Nichol (1998 a and b) the current study attempts to:

- Make a brief **preliminary analysis of the stakeholders** potentially involved in development of ecotourism and eco-enterprises;
- Identify potential ecotourism and eco-enterprise opportunities;**
- Make a SWOT analysis for each potential product** on the basis of primary information collected from stakeholders in the field, exploring the various issues likely to influence the development of nature tourism / leisure tourism, religious tourism, educational tourism and eco-enterprises;
- Analyse general barriers** to developing ecotourism and eco-enterprises and possible ways to overcome them;
- Prioritise upon the options on the basis of estimated feasibility, environmental sustainability and poverty impact;**
- Draw conclusions and recommendations** on the basis of the above analyses for an **integrated process** (involving tourism, eco-enterprise and sustainable fishing practices) **of enhancing the management of the Gulf of Mannar Marine Biosphere Reserve.**

Note that the analysis of barriers and possible ways of overcoming them, the SWOT analysis and the prioritisation with ranking on the basis of feasibility, poverty and environmental impacts are all necessary to the preparation of business plans for each of the chosen products / enterprises

### 3 Limitations of this study

In a 15-day study with 50% of the time spent on field activities and direct interaction with stakeholders it is impossible to address all the issues in a complex multi-stakeholder system involved in management of the Gulf of Mannar Marine Biosphere Reserve and the integration of ecotourism and eco-enterprise into it. Hence detailed studies on the following areas are suggested:

- **Market analysis** of each of the various ecotourism products and eco-enterprises suggested assessing interest among stakeholders in developing such enterprises / products, and analysing potential markets and marketing procedures with emphasis on possibilities to restrict or prevent middlemen from preventing profits reaching the poor. [In the short term continued collection and analysis of data from tourists using the questionnaire designed in this study could be useful.]
- Preparation of **comprehensive and participatory business plans** in the light of the information gathered from the market studies for each individual eco-tourism product or eco-enterprise.
- **Carrying capacity assessment** of the Gulf of Mannar area in terms of development of tourism and of enterprises such as agar production, seaweed cultivation, pearl oyster cultivation, aquaculture of economically valuable species and so on.
- **Detailed stakeholder analysis** leading to establishment of **active multi-stakeholder organisations** for managing stakeholder conflict and developing community based sustainable fisheries management plans for clearly defined areas, with combined **study and documentation** of this process.

These areas **MUST** be taken into consideration through detailed, in-depth study at the beginning of any tourism development programme. In addition the following studies will be necessary for assessing the impact of any management system that may arise.

- Continued studies on the **biodiversity of the area, especially monitoring changes in commercially exploited species** and those by-catch 'trash' species destroyed along with them.
- Continued studies to **monitor pollution levels** in the Gulf of Mannar and their effects on marine and coastal ecosystems.
- Other studies on issues that emerge as important in the course of developing ecotourism & eco-enterprise in the context of community-based sustainable fisheries management.

### 4 Methods

The study involved reference to secondary sources in available literature on the Gulf of Mannar and sustainable fisheries management in Malaysia and the Maldives plus a seven-day field visit to Rameshwaram and localities in the Gulf of Mannar for collection of primary data. Although it was planned to conduct PRA exercises with communities, this was impossible due to shortage of time with each group.

Methods of collection of primary data therefore included:

- Focus group discussion with villagers, self help groups and self help group federation staff;
- Semi-structured informal interviews with traders and street vendors, Fisheries Department staff, hoteliers, tourist guides, social workers;
- Questionnaire interviews with tourists (10 Indian religious pilgrims and 4 foreign tourists);
- Direct observations (e.g. of tourist behaviour, sanitation, coral, vegetation, general biodiversity, fishing practices, agar processing and pearl culture methods at CMFRI etc.).

## 5 Itinerary

Date	Activities
4 Feb 2002	Meeting with Steve Borgia to discuss Sterling Resort's neighbourhood friendly tourism at Swamimalai near Kumbakonum and also his visit to the Gulf of Mannar some years ago Literature search on Gulf of Mannar (GOM)
5 Feb 2002	Literature search on GOM
6 Feb 2002	First Meeting of Committee to review ecotourism opportunities for the Gulf of Mannar Region Literature search on GOM
7 Feb 2002	Literature search on GOM Naomi Saville and Suchitra Padmanabhan Depart Chennai c. 2100 hrs
8 Feb 2002	Arrive Rameshwaram, Ramanathapuram district c.1400 hrs Orientation meeting on GOM with Dr. Naomi, Ms. Suchitra, Dr. Selvam, Mr. Selvakku from Dhan Foundation and Mr. Prahalathan of Dhan Foundation providing background information on fishing communities and other local information.
9 Feb 2002	Visit to Krusudai Island in GOM near Mandapam Interviews with Vendors / shopkeepers selling to tourists
10 Feb 2002	Visit to Dhanushkodi (peninsula of Pamban Island) Meeting with Fishermen of the Dhanushkodi community (site of town wrecked by 1964 cyclone) Interview with tourist guides Interview with Swami Prevanananda - social worker in the area since 1982
11 Feb 2002	Festival day of new moon at Rameshwamy Temple Questionnaire Interviews with tourists Meeting at fishing and eco-beach tourist village of Sankumal
12 Feb 2002	Boat trip and snorkelling on coral nearby Sankumal with tourist guides Suchitra departed from Rameshwaram 1530 hours Interview with Mr. Ganesh of Department of Fisheries Visit to Central Marine and Fisheries Research Institute (CMFRI) to see aquarium, museum, agar production and artificial pearl production
13 Feb 2002	Visit to Nallathanni Island Interview with Dhan Foundation Self Help Group women in village nearest Nallathanni Island
14 Feb 2002	Interview with volunteer officers of the Federation of Self Help Groups and Dhan Foundation staff Interview with women's Self Help Group in Singivalla Kuruchi - lobster catching village Visit to village where Agar Processing Plant is being developed and meeting with committee members and villagers
15 Feb 2002	Interviews with Hoteliers in Rameshwaram Depart Rameshwaram to Kumbakonum 1230hrs Overnight in Swamimalai hotel
16 Feb 2002	Visit to Swamimalai Hotel and tourist attractions Depart Kumbakonum - Tambaran, Chennai pm
17 Feb 2002	Arrive Chennai am Report writing at MSSRF
18 Feb 2002	Report writing at MSSRF
19 Feb 2002	Report writing at MSSRF Submission of draft report to committee for discussion
20 Feb 2002	Second meeting of Committee to review ecotourism opportunities for the Gulf of Mannar Region Finalisation of report and submission of amended report

## 6 Stakeholder analysis

A summary of the stakeholders identified in the development of ecotourism and eco-enterprise within community-base sustainable fisheries management strategies is given in Table 1. This may not be an exhaustive list of the many stakeholders involved in this area but it gives an idea of the categories of stakeholders and the more important ones to be considered.

**Table 1. Stakeholders involved in the Gulf of Mannar Marine Biosphere Reserve and information about whether they were contacted in this study or not.**

Stakeholder	Interacted with in this study or not
<i>Fishing related</i>	
• Traditional fishers	Yes
• Mechanised boat operators	No
• Fish traders	Yes
• Money lenders	No
• Fishermen's associations	No
• Fisherwomen's associations	No
<i>Tourists</i>	
• Tamil Nadu state tourists	Yes
• Indian National tourists	Yes
• Foreign tourists	Yes
<i>Government authorities</i>	
• Department of Fisheries	Yes
• Central Marine and Fisheries Research Institute (CMFRI)	Yes
• Department of Forests	No
• Coast Guard Department	No
• Tamil Nadu Tourism Development Corporation (TTDC)	No
<i>Tourism market related</i>	
• Hoteliers (lodges and restaurants)	Yes
• Vendors / traders in tourist / religious goods	Yes
• Local travel agencies	Yes
• Outside tour operators	Yes
• Tourist guides taking tourists boating etc.	Yes
• Tourist guides taking tourists around the temple	No
<i>Development related</i>	
• Women's self help groups	Yes
• Federation of self help groups	Yes
• Dhan Foundation	Yes
• MS Swaminathan Research Foundation	Yes
• Social workers / personalities interested in development (e.g. Swami Pranavananda)	Yes
• Tamil Nadu Rural Reconstruction Movement (TNRMM)	No
• Shiva Ganga Social Service Society	No
• Other national and local NGOs working in the area	No
<i>Management of Gulf of Mannar Marine Biosphere Reserve related</i>	
• Multi-stakeholder Committee for the Management of the Reserve	No
<i>Religious</i>	
• Temple authorities	No
• Mutts	Yes

As indicated in Table 1, it was possible to interact briefly with many of the stakeholders involved during the field study. However some of the key stakeholders, such as the Forest Department and the Wildlife Protection officer within this office and the Coast Guard were not available to meet us during that week. Since their views on the matter of developing ecotourism products to the islands or within the seas around them could not be accessed it is difficult to assess the feasibility of these ideas. The Forestry Department has ownership of 20 out of the 21 islands in the Gulf of Mannar. This is because the Forestry Department is the responsible party for protecting all areas that come under the 1972 Wildlife Protection Act. Only Krusadai Island is still owned by the Fisheries Department and this issue appears to be the source of some contention between the two departments. The coast guard also has an important role because of the prevalence of smuggling (e.g. cannabis and other drugs) from Sri Lanka along this coast. In addition, Sri Lankan refugees, especially from the infamous "Tamil Tigers" (or LTT) use these waters and the 21 islands to escape into India, which means that the waters are restricted for non-fishing boat traffic.

A multi-stakeholder committee for the strengthening of the management of the marine biosphere reserve was formed in 1999 but this has to date never met. This committee could play a crucial role in the development of the area were it to be reactivated.

### *6.1 Interviews with stakeholders*

Detailed findings from the interactions with different stakeholders with whom it was possible to meet during the 7-day field study cannot be presented here for reasons of brevity. However the concerns of each group are touched upon in the descriptions of products, SWOT analyses and identification of barriers and means of overcoming them contained below.

## **7 Discussion of potential ecotourism products and eco-enterprises arising from the field study**

A number of different potential ecotourism products and eco-enterprises were identified in the course of the 7-day study in the Gulf of Mannar. A description of each potential product and enterprise is given in Section 7.1. This list should not be taken as absolute or comprehensive since it was impossible to visit all the 21 islands in the time available especially with the restrictions imposed by Forest Department and Coast Guards upon visiting all the areas, and the poor accessibility of many of them. Also, it may not be the case that all the potential products listed here could or should be developed in the event that an ecotourism development programme were to be initiated. A participatory analysis of this list with each of the potential stakeholders involved will be necessary to short list the potential enterprises and then each of them should be subjected to market and carrying capacity studies to examine their business potential and environmental and social impacts.

### *7.1 Description of each product / enterprise for the Gulf of Mannar*

For each of the products and enterprises proposed a brief description is given below. Each product will subsequently be submitted to an individual SWOT analysis (section 8). Then, products will be ranked in order of feasibility with indications of necessary inputs and stakeholder involvement, key factors, environmental and poverty-related impacts (section 9).

#### 7.1.1 Descriptions of Educational tourism products

- **Field study centre in Krusadai Island for scientists and university students**

This would involve the renovation of the existing field study centre on the island. On the stipulations of the Fisheries Department, the place would be reserved for school, college and university students and scientists exclusive use and would NOT allow ordinary leisure tourists to visit. No cooking or fires would be allowed and cooked food would have to be brought from Pamban village. Strict regulations on dumping of waste would be necessary (i.e. all non-biodegradable waste would be returned to the mainland). Renovation of the toilets, to check that an appropriately sized septic tank without seepage was functional, would be essential. If there would be likelihood of seepage of sewage into the aquifer from the toilets then shallow temporary composting pit latrines would need to be dug and properly used instead.

An absolute ban on collection of biological samples, especially *Balanoglossus*, would need to be established and rigorously enforced. Rules against walking on reefs, collection of shells or corals and strict codes of conduct about snorkelling procedures (no walking, no grabbing at corals) should be imposed and enforced. Areas where snorkelling is permitted and where it is banned should be defined and clearly demarcated. All visitors to the island should attend an obligatory lecture or video on the biological importance of the island, all the rules about its use and the reasons for imposing them. Punishments for violating rules should be enforced and involve hefty fines, especially collection of biological samples. On the island itself visitors should stick to trails and there should be certain areas closed to any visitors (including swampy areas) so that human disturbance is kept to a minimum. The disused museum should be opened and some interpretive materials added. However, since other interpretive and educational facilities are suggested below this should be done on a low-cost basis within minimal maintenance costs attached.

- **Interpretive centre on the Gulf of Mannar and its biodiversity (possibly in Rameshwaram close to the existing tourist centre)**

This would take the form of an information centre but using colourful and wherever possible interactive display material about the Marine Biosphere Reserve. Interpretive material should be clearly given in English, Tamil and Hindi. A video on the area should be developed and shown here and a computer with CD Rom about the Gulf of Mannar made available for visitors to access information. If possible Fisheries or Forest Department land should be used to develop this or failing this TTDC premises. It should be conveniently located within walking distance of the Ramanathaswamy temple and other tourist facilities on Pamban island, in order to attract the maximum number of visitors. If possible, if economics allow, no entrance charge should be levied so that the maximum number of tourists would be encouraged to come and find out about the Biosphere Reserve. Such a centre could also act as a 'nodal point' for authorised ecotourism boat operators, snorkelling trip operators, the proposed snorkelling and diving school, island trip operators, nature guides and fair trade handicraft vendors. If

such operators paid a small fee to the centre to be allowed to operate from there the centre might be able to pay for itself.

- **Oceanarium with examples of marine wildlife kept in large well-managed tanks, creating for the visitor a feeling of walking under the ocean.**

In contrast to the CMFRI aquarium, which is a large hall with relatively small tanks, the oceanarium would be designed to create an underwater wildlife experience for the visitor, through special effects, video clippings and actual exhibits of live marine wildlife in very large tanks. It should be developed as a commercial enterprise but with high-level technical and advisory inputs from specialists such as CMFRI scientists. The place should be subject to regular inspection by such experts to ensure that quality wildlife husbandry and only limited numbers of rare specimens were kept there. Interpretive material should be clearly given in English, Tamil and Hindi. Safety and hygiene would be of the utmost importance. Lessons and expert advice should be acquired from similar such attractions from Malaysia and Australia. Foreign investment or donor aid in order to create this attraction might be necessary at the outset but if the facility were to be well run and maintained very large numbers of fee paying visitors might visit and make it economically viable.

- **Modernisation and upgrading of the museum and aquarium of the CMFRI for school groups and students**

Since the CMFRI does not open on public holidays and does not allow foreigners, upgrading of their museum and aquarium should only be done on a limited scale and NOT for large influxes of ordinary Indian tourists. However, with small inputs and changes in management the existing facilities could function as an excellent educational facility for Indian school / university students. Provision of clear, colourful and interesting interpretive material in Tamil, Hindi and English for existing exhibits is the first priority. Improvements in husbandry, especially of marine turtles and large eels, which are currently contained in tanks that are much too small for them, are urgently called for. In the museum improved lighting and addition of more colourful and accessible material for students should be a priority. Photographs of live specimens in their natural habitats to accompany the many pickled ones in bottles should be added to give context and meaning to the exhibits. Development of a 'pro-education' and less closed outlook by the CMFRI is a necessary prerequisite to the improvement of these facilities.

- **Snorkelling and scuba diving school**

This facility should be developed as a private concern but with quality technical inputs on safety and precise information inputs on marine wildlife. The school should develop a snorkelling pool and a pressurised trial SCUBA diving tank with artificial corals for teaching and supervising students before taking them out into the sea. Very particular care should be taken in developing safety procedures, especially in the case of scuba diving. Lessons should include not only diving technique and safe practice but should also involve an obligatory lecture / video on biodiversity of the Marine Biosphere Reserve and the importance of conserving it (perhaps the same video could be developed for the interpretive centre, as an orientation for Krusadai island visitors and for boat trippers). Divers and snorkellers should only be allowed out into the open sea when they have shown competency not only at using the equipment safely but also in behaving in ways that do not damage the corals or other marine life. The school should develop levels of competency with corresponding certificates showing diving acumen combined with knowledge of marine life. After reaching the highest scale on identification of marine life forms the diver should be qualified as an authorised marine life guide and diving instructor. Strict quality controls over the awarding of such certificates would be necessary, making it impossible to 'buy' a certificate without having the knowledge or experience. A short class / examination in this diving school should form an obligatory part of a snorkelling boat trip.

- **Production of an interactive CD Rom / Website on the Gulf of Mannar**

A CD Rom which would also double as a website with information and photographs on the Gulf of Mannar, marine biodiversity, the Biosphere Reserve, history of Rameshwaram and other places of interest including their religious significance should be developed as a resource for interpretive centres, schools, tourist information centres, tourist attractions and to enable foreigners outside India to discover more about the area. The product should be produced by a private sector computer & education specialist with high quality technical inputs about the marine biodiversity from CMFRI and other centres of excellence within India and worldwide. Its distribution

through government departments and schools should be unlimited and funding should come from grant aid if possible rather than making the resource pay for itself by sales.

- **Student conservation volunteer holidays**

Following the example of successful conservation volunteer programmes in other programmes this product should aim to involve committed and well-informed groups of biology or related students in conservation activities. The students might stay at the Krusadai centre or in local schools or youth hostels on a very low cost basis and would be supervised by well-trained specialists in conservation biology. Volunteers should be old enough to behave responsibly and not need too much supervision. Activities that might be appropriate for the volunteers could be planting out mangrove saplings in degraded mangrove areas, helping to dump coral rubble to prevent erosion of coral island and further degradation of coral, conducting *non-invasive* studies of the distribution and abundance of various indicator species of ecosystem well being (e.g. certain seaweed species) or of plant species of special interest on the islands (e.g. the endemic mangrove species *Pemphis acidula*), making studies on bird life on different islands or in different habitats along the coast to provide comprehensive checklists, and so on. Funding for the students visits might be facilitated through assistance of natural history organisations or environmental pressure groups, NGOs or the student might fund themselves.

### 7.1.2 Descriptions of Religious tourism products

- **Package tour of religious sites**

This should be organised by private tour companies but should where possible involve *local* travel agents, vehicle operators and guides NOT outsiders. The tours should be bookable from outside the area but tourists should transfer from their long distance tours to the local transportation to make the tour. This is important to ensure that the tours generate local income. The tours should cover all the various important religious sites in the area, including Ramanathaswamy, Kodana Rama Temple, the holy tip of Dhanushkodi peninsular, Sita-, Ram- and Laxman- Tirthams and any other temples in the area. The tour guides should operate strict rules about littering and provide litter disposal facilities on the bus. Tourists should be encouraged to avoid spoiling the environment of the temples and tanks. A visit to the GOM interpretive centre mentioned above should be included in the tour. If possible the tour might also include visits to Women's Handicraft Cooperative producers to enable tourists to purchase fair-trade handicrafts direct from the producers and prices reasonable to the producers and tourists.

- **Renovation of lesser known temples and tanks**

This is a pre-requisite to the successful development of the package tour above. Renovations should be done tastefully in line with traditional architecture and styles. Advertisements painted on temple walls should be avoided. Renovation of tanks to improve their water harvesting capacities would form the dual purpose of making more pleasant bathing facilities for pilgrims and also providing emergency irrigation during droughts.

- **Yoga / meditation ashram in Swami Pranavananda's fishing community of Ramakrishnapuram**

This would involve the expansion of existing facilities in the ashram rather than creation of new ones (Swami Pranavananda). Accommodation would need to be developed on two levels: small simple huts equipped with bed and mosquito net within the compounds of fishing families to enable ashram visitors to stay as paying guests with village families and a small guest house for visitors near the ashram to be run cooperatively by a group of village women. The tourist huts should be separate rather than rooms within the villager's homes to provide sufficient privacy for the tourists and also avoid awkward cultural issues of entertaining unknown male guests at home. Simple local food should be available with families and in the ashram itself, payable on a per meal basis. Existing meditation facilities will probably suffice unless numbers increase enormously. Training of one of the village girls in yoga to an advanced level, together with English language would enable trainers in yoga to come up from within the community. Placement of an expert yoga teacher in the ashram for a year or two until the appropriate skills can be developed in the community would be a good solution. Rules about no alcohol, no smoking and no drugs should be enforced with visitors and anyone breaking the rules requested to leave.

- **Pilgrimage tours to Muniya Swami temple on Nallathanni Island**

Pilgrimage to the deity on Nallathanni Island already is taking place, but organised tours of pilgrims from Rameshwaram could increase the number of visitors and the revenue that might be earned from the people in the nearby communities. For this to be possible, permission from the Forest Department needs to be gained. Tours should only operate in seasons when the waters are safe enough and only on Tuesdays and Fridays (the auspicious days to worship the deity). A ceiling on the number of bus tours per day should be set (probably to no more than 2 x 50-seater buses per day). This would allow local and independent pilgrims to come and visit at the same time. Tour operators should form strong linkages with villagers of Keeha Mundal so that provision of local refreshments and basic groceries for their picnics can be assured and boats prepared to take groups out. As many as possible of the supplies should be accessed via the villagers to ensure local revenue from the enterprise. Boats should not be overloaded and lifebelts should be provided to all passengers, including children. Strict regulations on lighting fires with construction of fixed fire-pits away from vegetation should be enforced and pilgrims should be forbidden from walking on corals and wandering off from established trails around the islands.

### 7.1.3 Descriptions of Nature / Leisure Tourism products

- **Snorkelling boat trips to coral near Sankumal village (on the Palk bay side of Rameshwaram)**

This activity is already happening but needs to be legitimised. The villagers own some snorkelling gear and take out tourists most days in the good viewing season (March to August) and also during mid-January to February when the waters are beginning to clear after the NE monsoon. Currently the Coast Guard (CG) and Forest Department (FD) intercept fishing boats carrying tourists, partly due to the CG's remit to control illegal smuggling and immigrants from Sri Lanka and partly because of the FD's remit to protect the Gulf of Mannar marine natural resources under 1972 Wildlife Protection Act. The reef where the tourists are taken is close to Sankumal village only a few 100 metres from the beach. Being on the north side of Pamban island this is in fact not in the Gulf of Mannar and so should not be subject to restriction for nature conservancy reasoning. This reef is somewhat degraded (it is said to have died suddenly in 1977 after heavy rains and has only a small proportion of live coral) and continues to be damaged by local fishermen standing on it for fishing at low tides. However some colourful fish and other marine species can be viewed by beginner snorkellers here with no impact on the protected areas further from the shore. Since the reef is subject to use by villagers anyway, some additional pressure from snorkellers and people watching from boats is not likely to be as deleterious as it would be in more 'untouched' areas of coral and the activity there will draw tourists away from the really sensitive areas. In addition, by operating short boating trips for tourists the people of this village get valuable and necessary added income. Safety is less of a concern since the reef is so close to shore and no deep or rough waters have to be crossed to get to it.

- **Village tourism in Sankumal for model eco-beach in Rameshwaram locality**

As with the boating and snorkelling activities small-scale village tourism for foreign backpacker budget tourists already exists. The villagers have already built a few huts from local materials in which tourists stay from time to time. A few visitors come back repeatedly and stay for longer periods than most tourists (1-6 months), other stay a few days. As with the boating activities, the tourism accommodation is not authorised which means that police come and ask questions and harass the villagers. Authorisation of the huts is difficult to obtain because the villagers on the beach do not have land papers, as the area is government land. Should it become possible to either acquire the necessary papers or bypass the authorisation requirement through agreement with the local police, small-scale expansion and improvement of the existing village facilities could prove successful. Basic huts made of coconut thatch are sufficient, but provision of a bed and a paraffin lamp in each might make them more attractive. Digging of shallow pit compost toilets for both the villagers and the tourists is necessary if the beach is to be cleaned up and made attractive for tourists to sit, sunbathe and swim. Preparation of home-cooked fish, tea, coffee, and fish barbecues on the beach could be organised by the villagers providing them with increased revenue from the tourists. Sale of fruit, coconut water, and snacks to tourists who are enjoying the beach might also be a possibility for extra earnings. A small teashop already exists on the road by the beach, which could be expanded and made more appealing to tourists. Shortage of water resources however may limit the potential of expansion.

- **Development of eco-beach resort on the road to Dhanushkodi with accompanying optional extra activities of bird-watching, boat trips, nature walks, etc.**

The stretch of beach on the Gulf of Mannar side of the Dhanushkodi peninsula, beside the road out of Rameshwaram towards Dhanushkodi a few kilometers beyond Ramakrishnapuram, is beautiful, relatively deserted and clean compared to the Sankumal beach. The sea is clean clear and blue but the beach slopes steeply into the sea such that the water gets deep rather quickly and strong currents may occur along the shore. Small, scattered communities of fisher people have settled on the beach and they are involved in traditional shore seine fishing from the beach. There are no facilities for tourists in the area at present. If training in tourism management could be provided to the people along the beach and authorisation obtained from the necessary authorities (e.g. Forest Department), a small low-impact resort of the kind described for Sankumal village might be possible. Collections of coconut thatch huts, compost pit latrines, and basic sun-shelters and restaurants serving drinks and local snacks would be sufficient to attract foreign tourists seeking a deserted beach for sunbathing, swimming and relaxation. The attractiveness of the area is higher than Sankumal, since the beach and water are cleaner and the place more deserted, but the awareness of the local communities about tourism and tourist expectations much lower. Transport from Rameshwaram and the facilities available there is lacking and auto-rickshaws, who have a monopoly on the route are expensive. The peninsula has excellent opportunities for bird watching (flamingos, a variety of coastal waders, fish eating birds of prey and so on) and boat trips may be possible from the vicinity.

The village of Dhanushkodi itself (much further down the peninsula from the area suggested above) was destroyed in a 1964 cyclone and is now a collection of fisher people's temporary huts in the midst of ruined buildings. Currently people can take buses or auto-rickshaws to the end of the pitch road and then ride in 4-wheel drive fish truck across the sand to the tip of the peninsula. No tourism facilities (can be developed formally in the area since the government banned human habitation of the place after the cyclone. However trips out to this area and the tip of the peninsula can continue with the potential for adding bird watching and beach combing nature walks in the mornings and evenings for interested tourists from the suggested resort (or from the suggested yoga ashram). Training of nature guides in bird identification / use of binoculars and in identification of shells and other organisms on the beach would be necessary to accompany this activity. Such guides could also operate from the nodal point suggested in the Gulf of Mannar Interpretive centre.

- **Glass-bottomed boat trips to coral areas.**

Many tourists are interested in seeing marine life but may not be comfortable with swimming, diving and snorkelling. Development of special tourist boats with glass panels for viewing marine wildlife could prove very successful and generate a lot of income for operators, whilst also raising awareness about marine biodiversity. Safety issues would need to be addressed and the boats would have to be equipped with life buoys to throw to anyone falling overboard. Life belts need to be supplied for all passengers, including children. The boats should be flat-bottomed for viewing coral reef with minimal damage and they would need to be kept extremely clean and well maintained if effective viewing were to be possible. Boat operators or special marine wildlife nature guides would need to be trained in identification of species with English, Tamil and Hindi names and some explanation about their biology to make the trips interesting and educational for tourist. Strict limits on the number of people per boat and the number of boats allowed to visit different areas need to be established and enforced. Studies on the impact of glass-bottomed boats on the corals need to be carried out. Areas allowed for viewing from glass-bottomed boats and those from which all activities are banned need to be defined and clearly demarcated with buoys of different colours etc. Fines for straying into restricted areas should be levied.

- **Eco-beach resort on mainland near Nallathanni Island**

Along the same lines that tourist huts could be developed in Sankumal and along the way to Dhanushkodi, an 'ecobeach resort' could be developed on the beach near the village of Keeha Mundal. The beaches are beautiful there and relatively free of human waste but the sea is notoriously rough. The community lacks awareness about tourism and what tourist's needs are. The area is currently difficult to access because of poor roads and lack of fresh water makes development difficult.

- **Day trips to Nallathanni and / or other islands (e.g. Musal or 'Hare' Island) from Rameshwaram or Mandapam with associated snorkelling, bird-watching or other nature observation activities**

As mentioned above with reference to potential pilgrimage tours to the Muniya Swami shrine on Nallathanni island, the village of Keeha Mundal on the mainland near Nallathanni island already operates unofficial boats. If Forest Department permission could be given to the communities, such trips could easily be diversified to include nature-watching activities instead of or in addition to making offerings at the shrine. It is most likely that the tourist market segments would differ however and that tourists primarily interested in nature observation might be less interested in the shrine and vice versa. Since the fishers have good knowledge of sea life already it is a simple matter of teaching them to communicate this in Tamil and English, and perhaps also Hindi, to turn them into qualified nature guides. Villagers in the communities along the coast south of Mandapam have very little interaction with foreign tourists and lack awareness about what these tourists might expect or want. They would require training and awareness- raising about tourism, hygiene, sanitation, and biodiversity conservation issues. Snorkelling equipment would need to be brought in from outside and the local people trained in its safe and coral-friendly use. They would then need to qualify as trainers to teach tourists how to snorkel with minimal damage to corals and other marine life.

Selection of which islands to exploit for nature observation is difficult since only Krusadai, Pullivasal and Nallathanni islands could be visited in the time available. However the patterns of past and existing use and the 'tamed' nature of Nallathanni island suggests that Nallathanni might be a good candidate for use. Musal (or Hare) island was also identified as a potential area for 'experienced ecotourists' by Nichol 1998, but the condition of the vegetation and the current levels of exploitation of the resources there could not be assessed. Nichol described Musal and Nallathanni islands as 'less altered' than Krusadai, by which she probably means lacking in buildings and trails. Both Musal and Nallathanni islands in fact, having been privately owned in the past, contain vegetation that is much *more altered* (i.e. coconut and palmyra plantation) than that found on Krusadai which has more indigenous / virgin vegetation. Nichol also says that Nallathanni is 'less altered' than islands further north, though it is not really clear what she means by 'altered'. Road transport to the coast nearby Nallathanni island is difficult as road condition is very poor whereas Musal (Hare) islands can be more easily reached by boat from Mandapam.

The fragility of the marine resources and especially coral may not be easily assessed in the different islands. Descriptions of the corals on the different islands given by Deshmukh and Venkataramani (1995) suggest that Nallanthanni island snorkelling areas are 'ideal' for snorkelling whereas Musal (Hare) island snorkelling areas exist and the coral reef assemblages are 'interesting'. This suggests that Nallathanni waters may be better suited to snorkelling pressure than Musal island waters, which may have richer biodiversity in need of conservation. Comparative observations between areas are necessary to identify those areas of coral that might be able to tolerate snorkelling and those that might not. Selected areas (both those where snorkelling is allowed and where all disturbance is banned) need to be clearly demarcated.

- **Turtle hatchery with tourist viewing facilities**

Since there is interest amongst tourists about larger sea animals and since seas turtles are endangered, a turtle hatchery facility for rearing baby turtles and releasing them into the wild would be a good way of creating an ecotourism attraction and promoting conservation together.

- **Fish barbecues around fires on the beach in fishing villages for tourists (especially foreigners), perhaps with cultural entertainment such as folk song or dance around the fire.**

Local fisherwomen are highly skilled in the preparation of fish and tourists enjoy eating fresh fish from fishing areas. An easy small-scale enterprise that could be developed for tourists would be barbecuing fish over a fire after dark on beaches (e.g. Sankumal or any of the eco-beach resort locations were they to develop). Other attractions could be added to the entertainment such as folk singing and dancing around the fire, depending on the interests of the tourist. Training in food hygiene would be a useful preparation for the development of such enterprises.

- **Development of a neighbourhood friendly 'eco-resort' hotel**

Currently the local poor of the Gulf of Mannar region do not have the capacity to fulfil the expectations of richer tourists looking for luxury accommodation and facilities. However a hotel of this standard, if managed along the right lines, has the potential to provide employment for many local people and can promote understanding and appreciation of local culture. The proposed hotel or eco-resort could be developed along similar lines to the existing Swamimalai resort of Sterling Holidays. This hotel has a policy of employing local artisans and 60% of the employees are from the local community. Swamimalai employs a local traditional potter to make pottery to decorate the hotel and to demonstrate traditional crafts to tourists. It has a dairy farm established as a demonstration enterprise to the local community and donates part of the daily milk yield to the nearby home for the elderly. It assisted a school of iconography to become established making bronze castings, which are sold to tourists and has made a commitment to build one primary school for every 20 rooms developed in the hotel and has already built one local school. In the GOM region it would be excellent to draw better off tourists who might like to stay several days or a week by developing a hotel along these lines. Whereas the Swamimalai resort has a Hindu spiritual slant serving vegetarian food and not providing any bar, a fishing community hotel might specialise in local fish on the restaurant menu and provide locally (and hygienically) produced toddy to drink. The hotel could be centred round local fishing culture and might provide tourists opportunities to observe and / or participate in traditional fishing activities. Shell handicraft making, weaving of palmyra and coconut thatching and net-making (e.g. for tourist hammocks) could be demonstrated on the premises and fair trade in resulting handicrafts could be developed. Local song and dance could be incorporated into cultural shows in the evenings. As well as providing a platform to display local fishing culture to tourists other ecotourism products listed already (snorkelling, bird watching, boat trips to islands, glass bottomed boat trips over reefs, etc.) could be marketed from the hotel, allowing the hotel to act as a nodal point for different tourist sector enterprises to sell their products. The high quality of service demanded by tourists from this hotel would help to set appropriate hygiene and safety standards for use with other tourists. If possible in this instance a higher degree of community ownership than that found in Swamimalai would be desirable. A suitable location might prove difficult to find because of shortage of water in and lack of land document availability for coastal common lands. Hence a fishing village just inland, like Kunjarvallasai where the agar plant is being developed, might be appropriate. The resort could be a short drive away from the busiest tourist centres like Rameshwaram, providing the tourist with a feeling of being in 'untouched India'.

- **Pearl culturing by tourists**

The CMFRI has developed pearl cultivation and has pearl cultivation trials at Krusadai Island. This is fascinating to Indian tourists some of whom make special visits to the island just to see the trial site. This interest in the pearl cultivation could be harnessed as an eco-tourism activity to generate revenue for local people managing pearl oysters. Tourists could buy the artificial pearl seeds and pay to be allowed to implant them into their own oysters. A basket of implanted oysters for each tourist could then be labelled and maintained for the 6-8 months by pearl cultivators from the local community. The following year tourists could then return to see how many pearls their oysters produced. If they wanted to keep the pearls then fixed prices for pearls of different qualities should be payable to the pearl cultivators to compensate them for their efforts in maintaining the oysters and for loss of earnings from not selling the pearl in the open market. Tourist would thereby acquire personalised pearls at reasonable prices and pearl cultivators would gain added income.

#### 7.1.4 Descriptions of Eco-enterprises

- **Recycling enterprise, especially finding use for plastic bottles**

Although no technologies for recycling of plastic bottles were encountered (other than tying them to a pole by the road to help villagers find their way in the dark!) there may be some way of recycling plastic bottles. This needs to be investigated further as plastic bottle resources are plentiful.

- **Paper bag production (if possible using recycled materials)**

Although Tamil Nadu state has a ban on plastics, plenty are still in use in shops in Rameshwaram and plastic waste is dumped almost anywhere. Locally produced low-cost paper products to replace plastic bags would be an excellent enterprise if a local ban on plastics could be exercised. To start with simple recycling of used newspapers and magazines by making them into paper bags would be appropriate. Later local paper making enterprise options could be sought. Paper made of recycled banana fibre is already being produced successfully

in Dindigul district so technology could be transferred from women's self help groups there. However, the banana fibre being used in Dindigul district is not as readily available in coastal areas and if possible other suitable and readily available alternatives need to be found. Women of the Dhan Foundation's Federation of Self Help Groups might be able to undertake this kind of enterprise cooperatively.

- **Tailoring of cotton bags by tailors trained by ashram tailoring training centre**

If plastics are to be replaced then reusable cotton bags should have more demand. Although cotton cloth for such bags would have to be imported from elsewhere in the state, tailoring skills and sewing machines are available to women trained in the tailoring school of Swami Pranavananda's ashram. Through Swami's leadership the women could become organised into a cooperative or producers society for sewing and printing designs on to bags. Marketing of the bags would need to be addressed before the enterprise was developed.

- **Palm basket making for replacement of plastic packaging**

Palm basket making is already an occupation for many women in villages where palmyra is common. However the women have to work under exploitative conditions with very low pay. If women's self help groups in villages where palmyra weaving is common could organise women into palm basket enterprises for packaging to replace plastics, and fair trade marketing could be coupled with this, basket weaving might become more profitable for women.

- **Marketing of non-plastic alternatives accompanied by area-wide ban on plastics**

As mentioned above fair trade marketing of non-plastic alternatives and of other goods such as handicrafts is central to the success of the enterprise. This may call for a specialist marketing component to be established for eco-enterprise products. The federation of women's self help groups in the area might be an appropriate type of organisation to assist with this, or maybe a local NGO.

- **Production of bio-fertilisers from hotel / restaurant and temple organic wastes**

Hotel, restaurant and temple organic waste, although providing food for stray cows and pigs is unsightly, smelly and unhygienic. Since so many tourists pass through Rameshwaram and consume their food from banana leaves, and restaurants must also produce large amounts of vegetable peelings, vast amounts of biodegradable waste is available. Eco-enterprise organising the collection and composting of this waste could help to clean up the town and provide income for groups of women and / or men in the area. Expert advice as to whether to use conventional composting techniques or whether to try vermiculture or effective micro-organisms (EM) may be needed. However, composting is likely to be technically feasible, especially as MSSRF has techniques readily available in the Pondicherry biovillages and a centre in Auroville is producing EM. Market support to sell the bio-fertiliser may be necessary through Federations of Self Help Groups or local NGOs, especially as agriculture along the coast and within Pamban island is extremely limited.

- **Bicycle rental enterprise with bicycle workshop**

Since foreign tourists like to rent bicycles, opportunities exist for bicycle rental and maintenance enterprises associated with places for foreign tourists to stay such as the Swami Pranavananda yoga / meditation ashram. With the women's leadership already established in this community the enterprise could be entirely run by local women. It could also be replicated by women in Sankumal where village tourism might be developed.

- **E-mail & internet facility for tourists**

Since the Swami Pranavananda yoga ashram will be establishing a computer training centre run by women entrepreneurs and foreign tourists may be increasingly staying at the ashram, an enterprise providing e-mail and internet facilities to tourists could be profitable. Access to information from the GOM educational CD Rom mentioned above could also provide visitors to the centre with information on the area.

- **Women's cooperatives to make tourist trinkets and materials for worship in the temple**

The Federation of Self Help Groups could organise cooperatives or other organisations for the production and marketing of handicrafts made by women (e.g. shell handicraft-making, cotton wicks, sesame and cotton oil lamps, palm leaf baskets for offerings, and so on). Enterprises managed by the handicrafts producers themselves might ensure better working conditions and fair trade marketing.

- **Apiculture**

Although beekeeping is not commonly practised in the area beekeeping in Newton hives or using appropriate technology bamboo hives with indigenous *Apis cerana indica* might be possible. Honey and pollen could form invaluable dietary supplements and enterprise selling honey and beeswax products (e.g. candles and skin creams) could generate income for fishing communities. Forage from flowering trees such as coconut, palmyra, acacia, mangrove and other species was available at the time of the study but long drought periods and long rains may limit production. Technology and expertise from the Palni Hills Conservation Council is available in nearby Dindigul district, so a pilot trial might be possible with one or two Self Help Groups or NGOs to see the feasibility of the area.

- **Introduction of small-scale low-cost solar fish driers**

Fisher women are traditionally involved in fish drying. Solar driers could increase the rate of drying and make the processes more hygienic. Perhaps Fisherwomen's Cooperative Societies or Self Help Groups could cooperatively manage fish drying units for better quality dried fish. Opportunities for decreasing conflict between mechanised and traditional fishers might exist if traditional fishers involved in drying fish were able to purchase trawlers' trash catch for low prices.

- **Female guides and taxi / auto-rickshaw drivers for women travellers.**

Lone women travellers can be plagued by unwanted sexual harassment on their travels and hence would prefer whenever possible to travel with female guides or drivers. One such taxi driver-cum-guide already exists thanks to training organised by Swami Prenavananda. As demand for her services increases, especially through increasing visitors to the ashram, other women could be trained and an association of female drivers and guides established. This would be an innovative way for women of fishing communities to diversify their livelihoods and could provide opportunities for fruitful cultural exchange between the women.

- **Neem processing plants**

Neem is one of the few species that thrives on the sandy soils of the coastal areas of the Gulf of Mannar. The trees appear to need very little maintenance and, apart from use in folk medicine, the leaves and fruits are basically unexploited. It appears that there is an opportunity here for introducing harvesting and processing of neem. Advice would be necessary to decide whether fruit, leaves or a combination should be harvested and in what way, but production of neem powder and neem oil for biopesticide production and for use in ayurvedic medicine is likely to be possible. Further investigation into market possibilities and the most viable processing technology for cottage industry level production of neem products is needed but the use of the resource seems to have potential.

## 8 SWOT analysis for each of the different tourism products and eco-enterprises

<i>Potential educational tourism product</i> Field study centre in Krusadai Island	<i>Strengths</i>	<i>Weaknesses</i>	<i>Opportunities</i>	<i>Threats</i>
	<ul style="list-style-type: none"> <li>- The island is of enormous interest to biologists and is already well known as a 'biologist's paradise'.</li> <li>- Close to Pamban island and easy to reach by boat from Mandapam.</li> <li>- Renovation of buildings relatively cheap and environmentally sound compared to new construction.</li> <li>- Fisheries department suggests very strict rules such as no fires, no cooking, no dumping of non-biodegradable wastes.</li> <li>- Potential business opportunities for the people of Pamban in providing ready-cooked food to visitors, brought over by boat.</li> <li>- Boat transport facilities for visitors provide income to fishers, though not the poorest.</li> </ul>	<ul style="list-style-type: none"> <li>- Vulnerable to human interference since it is home to endemic species &amp; relatively untouched natural vegetation.</li> <li>- Conflict over ownership and management responsibilities between Govt Depts of Fisheries and Forests.</li> <li>- Difficult to police activities of visitors, especially biological specimen collection.</li> <li>- The reef ecosystems are already under some pressure from seaweed collectors which would be exacerbated by snorkelling.</li> <li>- The strict rules imposed by Fisheries Department may discourage visitors.</li> </ul>	<ul style="list-style-type: none"> <li>- Derelict buildings and a small defunct museum already exist.</li> <li>- Trails already exist.</li> <li>- Fisheries department (who currently own the island) are open to development of educational facilities on the island but to NO leisure tourism on the island itself.</li> <li>- The island is a haven of medicinal plant species, providing added interest for guided nature walks.</li> </ul>	<ul style="list-style-type: none"> <li>- Collection of biological samples (trophies) from this area is already threatening certain species (e.g. Balanoglossus).</li> <li>- Wildlife Protection Act enforcement or other government regulations could render development impossible.</li> <li>- Sewage and rubbish from students and scientists visiting, if not managed properly, could pollute the aquifer &amp; reefs around the island.</li> <li>- Walking on the reef or grabbing at coral by inexperienced swimmers could severely degrade it.</li> <li>- An exotic species of seaweed with potentially invasive properties has been introduced to one reef area of the island.</li> <li>- Numbers of visitors should be strictly limited to avoid over-exploitation.</li> <li>- Trampling of trails could disturb wildlife and endangered plant species.</li> <li>- Swampy areas are dangerous for walking (quicksands).</li> </ul>

<i><b>Educational tourism cont</b></i>	<i><b>Strengths</b></i>	<i><b>Weaknesses</b></i>	<i><b>Opportunities</b></i>	<i><b>Threats</b></i>
Interpretive centre on the Gulf of Mannar and it's biodiversity	<ul style="list-style-type: none"> <li>- Could raise awareness about the Marine Biosphere Reserve with minimal impact on the ecology of the area itself.</li> <li>- Useful as an attraction for school and university groups as well as the general public and foreign tourists.</li> </ul>	<ul style="list-style-type: none"> <li>- Expensive to create and maintain, especially if interesting and interactive media for presenting information are made available.</li> <li>- Rameshwaram would be the best location since more visitors go there than Mandapam, but land / space for the centre might be more difficult to find there.</li> </ul>	<ul style="list-style-type: none"> <li>- Government-owned land exists at the site of the existing TTDC Hotel Tamil Nadu in Mandapam.</li> <li>- Information on marine biodiversity is available, as many studies have been made on the area over the years.</li> <li>- Similar such interpretive centres have already been developed in Malaysia, providing short-cuts in the learning process for development.</li> </ul>	
Modernisation and upgrading of the museum and aquarium of the CMFRI for school and higher education students	<ul style="list-style-type: none"> <li>- Facilities already exist.</li> <li>- Addition of interpretive information to existing exhibits in the aquarium would be easy and cheap.</li> <li>- Improving lighting and adding colourful, easy to digest materials to museum would be possible.</li> </ul>	<ul style="list-style-type: none"> <li>- CMFRI closes on all public holidays and outside office working hours.</li> <li>- No foreigners are allowed within the gates and certainly NOT in the museum.</li> <li>- Current aquarium has no interpretive material to explain to visitors what they are observing.</li> <li>- Museum is largely samples of marine and other life forms pickled in glass jars. This is not very stimulating or memorable for students.</li> <li>- Current tanks for turtles and large eels are far too small and humane husbandry is lacking.</li> </ul>	<ul style="list-style-type: none"> <li>- Existing museum and aquarium are quite good so costs of upgrading should not be too high.</li> <li>- The place already attracts quite large numbers of visitors.</li> </ul>	<ul style="list-style-type: none"> <li>- CMFRI is in decline rather than growth (no. of scientists have reduced from 70 to 9, three of whom are transferred to Chennai). If CMFRI were to close investment would be wasted.</li> <li>- Could be subject to pressure from animal rights or ecological activists.</li> <li>- CMFRI may be resistant to making changes to existing systems.</li> </ul>

<i><b>Educational tourism cont</b></i>	<i><b>Strengths</b></i>	<i><b>Weaknesses</b></i>	<i><b>Opportunities</b></i>	<i><b>Threats</b></i>
Oceanarium	<ul style="list-style-type: none"> <li>- Would be of interest to the general public (i.e. any Indian tourist and not specialised 'ecotourists').</li> <li>- Could probably generate revenue more than sufficient to cover maintenance.</li> <li>- Would attract non-swimmers.</li> <li>- Apart from the relatively small number of marine flora and fauna kept captive, the attraction would not impact upon the natural marine resources or corals.</li> <li>- Could function as an attraction in poor weather and during off-seasons for boating etc.</li> <li>- Accessible to illiterates</li> </ul>	<ul style="list-style-type: none"> <li>- Very expensive to create and maintain.</li> <li>- Requires high-tech equipment and advanced methods to keep marine life alive and thriving.</li> <li>- Requires high levels of staff training and commitment to maintain properly.</li> <li>- Entrance fees may need to be relatively high to cover maintenance and staff costs, thereby excluding the poorest.</li> </ul>	<ul style="list-style-type: none"> <li>- Similar such an oceanarium has been developed in Malaysia, so approaches, lessons and experiences could be acquired from there.</li> <li>- Technology for culture of marine life forms already developed by CMFRI for several species.</li> <li>- Concessionary rates for students and school groups could be introduced.</li> </ul>	<ul style="list-style-type: none"> <li>- Could suffer from bad management and poor welfare of marine organisms unless very well managed.</li> <li>- Could prove prohibitively expensive to establish and run, especially as it would have to 'compete' with CMFRI educational facility.</li> <li>- CMFRI may not agree to provide technical assistance.</li> <li>- Humane husbandry of marine wildlife especially the larger sized life forms could prove difficult.</li> </ul>
Snorkelling and scuba diving school	<ul style="list-style-type: none"> <li>- Would enable many more tourists to be able to observe and appreciate coral reefs and marine wildlife first hand.</li> <li>- Likely to be of interest to foreign tourists and to Indian tourists with more money to spend.</li> </ul>	<ul style="list-style-type: none"> <li>- If badly managed could increase snorkelling and diving activities beyond the carrying capacity of the area.</li> <li>- Expensive to set-up, especially SCUBA diving facilities.</li> <li>- Requires highly trained teachers, currently not available in India since snorkelling is not an established pastime.</li> </ul>	<ul style="list-style-type: none"> <li>- Snorkelling and SCUBA diving are the largest expanding types of ecotourism.</li> <li>- Could greatly enhance public awareness and commitment to conservation of marine wildlife.</li> </ul>	<ul style="list-style-type: none"> <li>- SCUBA diving could be very dangerous if not properly taught or if equipment were faulty.</li> <li>- Risk of accidents</li> <li>- Damage to corals if badly managed</li> </ul>

<i><b>Educational tourism cont</b></i>	<i><b>Strengths</b></i>	<i><b>Weaknesses</b></i>	<i><b>Opportunities</b></i>	<i><b>Threats</b></i>
Production of an interactive CD Rom / Website on GOM	<ul style="list-style-type: none"> <li>- Relatively cheap to develop compared to attractions like oceanarium.</li> <li>- Easily and cheaply replicated and distributed to places with computers.</li> <li>- Can be made interesting and interactive for the user enabling people to learn more.</li> <li>- Easily turned into an internet site to share information about the Marine Biosphere Reserve throughout India and the world</li> </ul>	<ul style="list-style-type: none"> <li>- Only accessible to people with access to computers, which excludes most of the poorest and those in remote areas.</li> <li>- Information mainly accessible to computer literate and literate people.</li> </ul>	<ul style="list-style-type: none"> <li>- Interactive educational CD Roms on many subjects are already in existence, providing examples of effective tools and approaches.</li> <li>- Expertise in developing such educational materials exists within India.</li> <li>- Could be distributed to information villages with computer networks including the suggested computer training centre suggested for the village of Ramakrishnapuram just outside Rameshwaram</li> </ul>	<ul style="list-style-type: none"> <li>- Could become 'obsolete' relatively fast as computer technology changes and develops so quickly.</li> </ul>
Student conservation volunteer holidays	<ul style="list-style-type: none"> <li>- Would raise awareness and increase commitment of students to nature conservation.</li> <li>- Could be used for simple non-invasive biological monitoring of indicator species.</li> <li>- Relatively low cost means of getting conservation / scientific monitoring work done, compared with employing specialists.</li> </ul>	<ul style="list-style-type: none"> <li>- Supervision of students to limit their activities to environmentally positive ones could be difficult.</li> <li>- Funding of student travel and accommodation might be difficult.</li> <li>- Could prove more expensive than using local unskilled labour.</li> </ul>	<ul style="list-style-type: none"> <li>- Many countries have well-established conservation volunteering systems from which to learn.</li> <li>- India has active environmental pressure groups and natural history societies through which such volunteering could be promoted.</li> <li>- Some such activities are already taking place elsewhere in India.</li> </ul>	<ul style="list-style-type: none"> <li>- Too many students or inappropriate behaviour could be more damaging than positive to fragile ecosystems</li> </ul>

<b>Potential religious tourism product</b>	<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
Package tour of religious sites	<ul style="list-style-type: none"> <li>- Easy and cheap to develop</li> <li>- Not exerting pressure on marine wildlife.</li> <li>- Affordable for many Indian pilgrims.</li> </ul>	<ul style="list-style-type: none"> <li>- Difficult to involve the poorest stakeholders in benefits.</li> <li>- Potentially no gain in terms of awareness raising about the marine biosphere reserve</li> </ul>	<ul style="list-style-type: none"> <li>- Indian pilgrims are very interested in such tours.</li> <li>- Various religious sites exist in the area, mentioned in the Ramayan and thus of interest to pilgrims.</li> <li>- Visit to the interpretive centre on marine biosphere reserve could be incorporated into the tour</li> </ul>	<ul style="list-style-type: none"> <li>- Could have negative environmental impacts unless managed very well e.g. littering, no toilet facilities, dirty tank water, poor maintenance, etc.</li> </ul>
Renovation of lesser known temples and tanks	<ul style="list-style-type: none"> <li>- Relatively cheap</li> <li>- Tank water could have dual function of spiritual bathing water and as local rain water harvesting for irrigation in droughts</li> <li>- Might draw some of the environmentally negative tourist pressure away from Rameshwaram.</li> </ul>	<ul style="list-style-type: none"> <li>- No particular positive impact upon the Marine Biosphere Reserve</li> </ul>	<ul style="list-style-type: none"> <li>- Many small temples and tanks exist in the area</li> </ul>	<ul style="list-style-type: none"> <li>- Could result in spread of tourist litter and sewage pollution into previously unaffected areas</li> </ul>
Yoga / meditation ashram	<ul style="list-style-type: none"> <li>- Strong leadership of Swami Pranavananda who promotes gender equity and opportunities for women / the poor.</li> <li>- Existing small market of religious foreign and Indian tourists, which could be expanded to a limited extent.</li> <li>- Relatively small inputs could make a large difference because the existing infrastructure and community focal point created by the ashram is there already.</li> </ul>	<ul style="list-style-type: none"> <li>- Swami Pranavananda and his team running the ashram and school are already busy with social work. Expanding facilities for tourists could take up their valuable time and detract from social programmes.</li> <li>- Screening of tourists is necessary as the ashram forbids consumption of alcohol, smoking of tobacco or cannabis etc.</li> <li>- The place has many mosquitoes in the non-drought months.</li> </ul>	<ul style="list-style-type: none"> <li>- A thriving ashram, which already receives some foreign and Indian visitors, exists in Ramakrishnapuram.</li> <li>- Village tourism through the ashram is already developed on a small scale.</li> <li>- Yoga teaching and meditation tuition and spaces exist already.</li> <li>- Foreigners who stay there always enjoy their stay.</li> </ul>	<ul style="list-style-type: none"> <li>- Too many visitors would put a strain on the village water resources (already in very short supply) and sanitation capacity.</li> <li>- Since Swami Pranavananda is a 'revolutionary monk' (to use his own term) there could be problems with authorities in getting the necessary legal documents / official papers for ashram expansion.</li> </ul>

<b><i>Religious tourism cont.</i></b>	<b><i>Strengths</i></b>	<b><i>Weaknesses</i></b>	<b><i>Opportunities</i></b>	<b><i>Threats</i></b>
Pilgrimage tours to Muniya Swami temple on Nallathanni Island	<ul style="list-style-type: none"> <li>- The island has fewer rare and endemic species than Krusadai island since it is largely planted with coconuts and palmyra (which exist since the time of private ownership). This means that tourists walking to the shrine are unlikely to trample or disturb any endangered species.</li> <li>- Visitors who come don't stay overnight on the island.</li> <li>- Three women are allowed to stay on the island to 'guard it from misuse' in return for being able to use the resources available to make coconut thatching and palmyra mats. This means that visitors are visiting an already-exploited area.</li> <li>- Easy to develop as a local tourism product since the fishing communities have the boats, language and facilities to meet these tourist's expectations.</li> </ul>	<ul style="list-style-type: none"> <li>- Current pilgrimage trips are 'unofficial' i.e. not endorsed formally by forestry department.</li> <li>- Safety equipment such as life belts and life buoys are desperately needed, yet too expensive and difficult to obtain for fishers to purchase.</li> <li>- Not possible to visit during SW monsoon when sea is very rough (May to September).</li> </ul>	<ul style="list-style-type: none"> <li>- Already around 50 pilgrims come to the shrine each auspicious Tuesday and Friday.</li> <li>- The importance of the shrine and numbers of visitors is growing slowly by word of mouth of the pilgrims who feel that their prayers have been answered after visiting.</li> <li>- Fishers are already earning from renting out boats and selling groceries to the visitors for their picnics and offerings.</li> </ul>	<ul style="list-style-type: none"> <li>- Pilgrims who come tend to sacrifice goats, which they cook there for a picnic meal. Fires started by such picnics in the dry seasons could have devastating effects.</li> <li>- Forest department may prohibit expansion of pilgrimage usage.</li> <li>- The sea between the island and the mainland is notoriously rough and accidents have already happened to tourists (2 deaths).</li> </ul>

<i>Potential ecotourism product</i>	<i>Strengths</i>	<i>Weaknesses</i>	<i>Opportunities</i>	<i>Threats</i>
Snorkelling boat trips to coral near Sankumal village	<ul style="list-style-type: none"> <li>- Reef is not actually within the biosphere reserve as it is on the Palk Bay side of Pamban island. This means that snorkelling on this coral area might reduce pressure on those areas protected by the 1972 Wildlife Protection Act.</li> <li>- Very close to Rameshwaram. Only 5 minutes walk from Hotel Tamil Nadu and a few minutes by boat to the reef near the beach.</li> <li>- Already established as a destination for small scale boating and snorkelling.</li> <li>- Many Indian visitors don't swim which may restrict damage to the corals.</li> </ul>	<ul style="list-style-type: none"> <li>- The reef is rather degraded with only some live areas.</li> <li>- Locals and tourists are ignorant of the potential damage to coral by walking upon it.</li> <li>- The reef was large and healthy until 1977. The villagers claim that heavy rain over 12 days decreased salinity and killed it suddenly.</li> </ul>	<ul style="list-style-type: none"> <li>- A steady flow of both Indian and foreign tourists is already visiting.</li> <li>- The foreign tourist guides have snorkels to rent out to tourists already.</li> <li>- The guides have some knowledge of the biodiversity and can name some species with English names.</li> </ul>	<ul style="list-style-type: none"> <li>- Coast guards and police intercept boats carrying tourists and may make it impossible for community members to take them out in boats, especially to areas further from the Sankumal village reef.</li> <li>- Police also come round to this village investigating since tourist accommodation isn't registered.</li> <li>- Local fishers stand / walk on the reef for fishing in the mornings, further degrading the coral.</li> <li>- An increase in visitors could severely damage the reef.</li> </ul>

<i><b>Ecotourism cont.</b></i>	<i><b>Strengths</b></i>	<i><b>Weaknesses</b></i>	<i><b>Opportunities</b></i>	<i><b>Threats</b></i>
Village tourism in Sankumal for model eco-beach	<ul style="list-style-type: none"> <li>- Small numbers of backpacker / budget tourists come already varying between zero to 300 per year.</li> <li>- The village has several guides trained on formal tourist guide courses and others with many years experience of taking tourists out on boats.</li> <li>- Several of the villagers who work with tourists have reasonable English.</li> <li>- Some tourists enjoy food cooked by the local women.</li> <li>- Very close to Rameshwaram making it easy for tourists to access by foot.</li> <li>- Excellent for foreign tourists seeking a 'real Indian coastal village experience'.</li> <li>- Small teashop by the beach provides very basic commodities for tourists.</li> </ul>	<ul style="list-style-type: none"> <li>- No sanitation in the village, not even for tourist huts.</li> <li>- Beach is used as open toilet.</li> <li>- The villagers have no land documents.</li> <li>- The accommodation (huts on the beach) is not registered as approved accommodation for tourists.</li> <li>- Some of the accommodation lacks basic facilities (bed, paraffin lamp).</li> <li>- Water shortage means tourist presence puts pressure on an already over-stretched resource.</li> <li>- Poorer villagers lack capacity to meet tourists' needs.</li> <li>- Most of the women lack language skills to communicate with foreign tourists.</li> </ul>	<ul style="list-style-type: none"> <li>- Already established as a destination for tourists. Even written about in one foreign guide.</li> <li>- Several basic huts built for tourists, which have been used already.</li> </ul>	<ul style="list-style-type: none"> <li>- Huts in which tourists stay are not registered as guest houses, so police come asking questions and could stop the enterprise.</li> <li>- Drug smuggling and dealing in cannabis occurs in the area leading to high levels of police suspicion / harassment. If locals were charged for drug dealing to tourists this could jeopardise the enterprise.</li> <li>- Lack of fresh water and toxic desalinated water supply means expansion of tourist facilities is severely limited.</li> <li>- Police threaten to evict the villagers from this land for tourism development.</li> </ul>

<b><i>Ecotourism cont.</i></b>	<b><i>Strengths</i></b>	<b><i>Weaknesses</i></b>	<b><i>Opportunities</i></b>	<b><i>Threats</i></b>
Eco-beach resort with temporary tourist huts on Dhanushkodi peninsula	<ul style="list-style-type: none"> <li>- The beach on the Gulf of Mannar side of Dhanushkodi peninsula has clear, clean blue water, white sand and is relatively clean.</li> <li>- Not densely populated currently. Only a few fishermen and women (poor labourers working for shore seine fishers) live along the beach.</li> <li>- Traditional fishing activities are culturally interesting for tourists to observe.</li> <li>- Small-scale facilities for tourists (huts, coconut thatch shelters for protection from sun and for sale of refreshments) could provide alternative income sources for poor fishers.</li> <li>- Close to existing tourist attractions.</li> <li>- Huts for tourists would be cheap to develop.</li> </ul>	<ul style="list-style-type: none"> <li>- Shortage of fresh water resources could limit possibilities of establishing tourist facilities.</li> <li>- If tourism becomes popular local poor fishers may be squeezed out as richer and more experienced business people will be able to create better facilities.</li> <li>- Pressure upon the nearby forestry plantations for firewood might generate conflict with Forest Department.</li> <li>- Swimming opportunities limited i.e. safety of tourists difficult to ensure.</li> <li>- Local fishers lack capital to develop tourism huts and lack capacity to meet tourist expectations.</li> </ul>	<ul style="list-style-type: none"> <li>- Natural unspoilt resource is there and not heavily populated.</li> <li>- En route to Dhanushkodi tip with reasonable road access (i.e. midway between existing attractions of Rameshwaram and Dhanushkodi).</li> </ul>	<ul style="list-style-type: none"> <li>- Beach slopes steeply, becomes deep quickly and has strong currents making it risky as a location for swimmers.</li> <li>- The peninsula is prone to cyclones which means that no 'permanent' infrastructure should be invested in.</li> </ul>

<i><b>Ecotourism cont.</b></i>	<i><b>Strengths</b></i>	<i><b>Weaknesses</b></i>	<i><b>Opportunities</b></i>	<i><b>Threats</b></i>
Glass-bottomed boat trips	<ul style="list-style-type: none"> <li>- Glass bottomed boats would be popular, especially among non-swimmers interested in viewing marine life.</li> <li>- If tourists were only permitted to view marine life from the boat, instead of walking on reefs or snorkelling, the boats could decrease pressure on reef resources.</li> </ul>	<ul style="list-style-type: none"> <li>- Expensive to buy and maintain.</li> <li>- May be more risky i.e. difficult to operate safely.</li> <li>- Only richer boat owners / fish traders would be able to buy the boats.</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Interest in riding in glass bottomed boats amongst tourists</li> </ul>	<ul style="list-style-type: none"> <li>- Boat operators may be not allowed to take tourists by coast guard and may be prevented from accessing coral reef areas by Forest Department.</li> <li>- If boats are not well maintained their engines may be very polluting</li> </ul>
Eco-beach resort on mainland near Nallathanni Island	<ul style="list-style-type: none"> <li>- Beautiful unspoilt beach.</li> <li>- Clear blue clean sea.</li> <li>- Beach cleaner than in some areas because the people use the <i>Acacia</i> scrub inland for toilet facilities in preference to the beach.</li> <li>- Local materials (coconut thatch) available for building huts and local people have skills to build them.</li> <li>- If developed, rent of tourist huts and provision of simple food for tourists could provide alternative income to fishing.</li> </ul>	<ul style="list-style-type: none"> <li>- 3 hours drive from Rameshwaram with the current road condition.</li> <li>- Salt industry and ship breaking yard en route are unsightly and may deter tourists.</li> <li>- Very few facilities for refreshment and no hotel accommodation in the area.</li> <li>- Most of the existing Indian tourists would not choose to stay in hut-style accommodation, which means a new market segment would need to be attracted.</li> <li>- Villagers lack the awareness of what tourism involves (especially foreign back-packer tourism).</li> <li>- Low capacity to meet tourist expectations or provide for their needs in the village.</li> <li>- No sanitation to speak of in the village (one or two toilets in richest households).</li> <li>- Severe water shortage makes creating tourist accommodation difficult.</li> </ul>	<ul style="list-style-type: none"> <li>- Some Indian pilgrims come to the area already to visit the Muniya Swami shrine on Nallathanni Island.</li> <li>- Good for foreigners seeking a more 'remote Indian village experience'.</li> <li>- A small village-based teashop serving dosas and other local foods already exists which could be improved upon and replicated.</li> </ul>	<ul style="list-style-type: none"> <li>- If roads are not improved few tourists would be prepared to take the trouble to travel there.</li> <li>- Risk of tourist boats capsizing and drowning of swimmers drowning in the rough sea.</li> <li>- Lack of fresh water makes it difficult to develop accommodation for tourists. Conflict over water resources would be likely to arise.</li> </ul>

<i><b>Ecotourism cont.</b></i>	<i><b>Strengths</b></i>	<i><b>Weaknesses</b></i>	<i><b>Opportunities</b></i>	<i><b>Threats</b></i>
Day trips to Nallathanni and / or other islands (e.g. Musal or 'Hare' Island)	<ul style="list-style-type: none"> <li>- Would <u>not</u> require development of accommodation for tourists in untouched coastal areas with water shortages, nor on the islands themselves.</li> <li>- Would be less likely to put pressure upon the marine wildlife than making nearby resorts (providing quotas for visitors were adhered to).</li> </ul>	<ul style="list-style-type: none"> <li>- If roads were not developed the boat trips to reach the islands would prove long and expensive.</li> <li>- Even to drive to Nallathanni Island mainland makes for a long day trip in present conditions.</li> <li>- Few tour operators would want to take their vehicles down the roads because of the poor road conditions.</li> <li>- Seas near Nallathanni are notoriously rough.</li> </ul>	<ul style="list-style-type: none"> <li>- Some boat operators take people to Nallathanni island already.</li> </ul>	<ul style="list-style-type: none"> <li>- Forest Department might not allow it.</li> <li>- Lack of infrastructure i.e. good roads might make it impossible.</li> <li>- Disturbance by tourists could disrupt turtle breeding and trampling of coral and plant on the islands might damage rare or endemic species.</li> <li>- Safety of tourists would be difficult (no life belts or lifebuoys in use currently).</li> <li>- If boats are not well maintained their engines may be very polluting.</li> </ul>
Turtle breeding centre with tourist viewing facilities	<ul style="list-style-type: none"> <li>- Could increase numbers of turtles if reared turtles are re-released back into the wild.</li> <li>- Could decrease pressure upon the marine resources by providing alternative attraction.</li> </ul>	<ul style="list-style-type: none"> <li>- Humane husbandry of the turtles might be difficult.</li> <li>- Might be expensive to maintain.</li> </ul>	<ul style="list-style-type: none"> <li>- Technology / methods for breeding turtles in captivity exist in CMFRI.</li> <li>- Many tourists are interested to see marine turtles.</li> </ul>	<ul style="list-style-type: none"> <li>- Tourists viewing turtles might disturb them and discourage breeding.</li> <li>- Inbreeding of turtles kept in captivity might decrease fitness of the species.</li> <li>- Lack of shyness might make released turtles vulnerable to capture by poachers.</li> </ul>
Fish barbeques around fires on the beach	<ul style="list-style-type: none"> <li>- Requires no special infrastructure or investment to develop.</li> <li>- Compatible with villagers' daily routines i.e. not taking their time from other productive activities.</li> <li>- Using resources (i.e. fish) that the community has readily available.</li> <li>- Skills in preparing fish exist locally.</li> <li>- Cooking could be combined with low-key, non-intrusive cultural show of traditional folk song and dance.</li> </ul>	<ul style="list-style-type: none"> <li>- Firewood availability maybe limited.</li> <li>- Fire sites might make the beach look dirty or untidy.</li> <li>- Villagers may be unaware about hygiene requirements.</li> <li>- Proper disposal of rubbish generated could prove difficult.</li> </ul>	<ul style="list-style-type: none"> <li>- Those tourists who eat the fish cooked by women in Sankumal village find it delicious.</li> <li>- Suggested by a foreign tourist as an idea.</li> </ul>	<ul style="list-style-type: none"> <li>- May be discouraged by government authorities.</li> </ul>

<i><b>Ecotourism cont.</b></i>	<i><b>Strengths</b></i>	<i><b>Weaknesses</b></i>	<i><b>Opportunities</b></i>	<i><b>Threats</b></i>
Pearl cultivation by tourists	<ul style="list-style-type: none"> <li>- Building on existing tourist interest and new enterprise for fishing families</li> <li>- Combines well with boat trips</li> </ul>	<ul style="list-style-type: none"> <li>- Rates of pearl production may be lower than tourists hoped for.</li> <li>- Irritant artificial pearl seeds are expensive/ imported from Japan</li> </ul>	<ul style="list-style-type: none"> <li>- Tourists are interested</li> <li>- CMFRI has technology</li> <li>- MSSRF is introducing pearl cultivation to 10 families already</li> </ul>	<ul style="list-style-type: none"> <li>- May not be cost effective</li> </ul>
Luxury eco-resort with neighbourhood friendly and fair trade policies	<ul style="list-style-type: none"> <li>- Would attract richer tourists with more money to spend.</li> <li>- Could provide employment and skill development opportunities for local people.</li> <li>- Local handicrafts producers (basket weavers, shell handicraft makers) or other local artisans might find opportunity for fair trade marketing of their produce and / or income from demonstrations to tourists.</li> <li>- Could generate income for local schools or women's groups etc.</li> <li>- Could provide income generation opportunities through cultural shows of local folk music and dance, which might also increase cultural pride and sense of identity.</li> <li>- Could promote sustainable fish consumption by only serving fish species that are not over-fished and are caught by traditional methods (e.g. line fishing).</li> <li>- Could provide guidance, infrastructure and resources for the development of other related products (boats trips, village tours etc.) and also training opportunities to local people.</li> <li>- Might set an example of a more ecologically friendly and fair-trade oriented enterprise to be replicated by others.</li> </ul>	<ul style="list-style-type: none"> <li>- Water availability might be difficult, especially as luxury hotel have enormous water consumption.</li> <li>- Would generate more profit for the hotel owners / operators than for the local poor.</li> <li>- Community-ownership would be difficult to manage if quality assurance were to be maintained.</li> <li>- The type of community suitable for development of a resort would need to be inland from the coast in order to access water and these communities may not be the neediest and tourists may prefer a beach location.</li> </ul>	<ul style="list-style-type: none"> <li>- A precedent for the type of hotel envisaged already exists (Sterling Holidays Swamimalai Resort near Kumbakonum).</li> <li>- The village of Kunjarvallasai (where a community-owned agar plant is being developed by MSSRF) has a mobilised community.</li> </ul>	<ul style="list-style-type: none"> <li>-</li> </ul>

<b>Potential eco-enterprise option</b>	<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
Recycling enterprise, especially finding use for plastic bottles	<ul style="list-style-type: none"> <li>- Would turn a current problem into a resource.</li> </ul>	<ul style="list-style-type: none"> <li>- Existing methods of recycling and reusing bottles have not been encountered.</li> <li>- May involve expensive processes and high tech solutions that are inaccessible to the poor.</li> <li>- Start up support and technical advise would be necessary.</li> </ul>	<ul style="list-style-type: none"> <li>- Plastic bottles are readily available everywhere.</li> </ul>	<ul style="list-style-type: none"> <li>- Technology for effective recycling most probably is not available.</li> </ul>
Paper bag production	<ul style="list-style-type: none"> <li>- Would provide local alternatives to plastics.</li> <li>- Old newspaper and magazines are probably available in Rameshwaram, Mandapam etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Local production may not prove cheaper than importing mass-produced paper bags from outside, making marketing impossible.</li> <li>- Paper making materials were not encountered on Pamban island nor on the mainland coast.</li> <li>- Start up support might be necessary.</li> </ul>	<ul style="list-style-type: none"> <li>- Technology for producing paper-bags and other paper products from banana fibre already exists.</li> <li>- A ban on plastics is already being pushed in Rameshwaram by the community.</li> </ul>	<ul style="list-style-type: none"> <li>- Suitable material for paper manufacture may not be available locally in sufficient quantities.</li> <li>- May not be economically viable (can only know after market study)</li> </ul>
Tailoring of cotton bags to replace plastics with tailors trained by ashram tailoring training centre	<ul style="list-style-type: none"> <li>- Skills exist.</li> <li>- Value addition possible through simple printing of bags with local logos.</li> <li>- Could provide alternative employment and income generation to local women.</li> </ul>	<ul style="list-style-type: none"> <li>- Locally produced cotton is not available.</li> <li>- Importing cotton from other areas together with providing fair wages to tailors may make the bags more expensive than existing cotton bags in the market.</li> <li>- Start up support would be necessary.</li> </ul>	<ul style="list-style-type: none"> <li>- Skilled tailors with their own sewing machines exist and are organised via Swami Pranavananda's ashram tailoring school.</li> <li>- Social mobilisation to start such an enterprise could be easily managed by Swami.</li> </ul>	<ul style="list-style-type: none"> <li>- May not be economically viable (can only know after market study)</li> </ul>
Palm basket making for replacement of plastic packaging	<ul style="list-style-type: none"> <li>- Uses local material and local skills.</li> <li>- Could provide alternative employment and income generation to local women.</li> </ul>	<ul style="list-style-type: none"> <li>- Not all communities have sufficient palmyra, especially the poorest communities on the coast with the greatest need for diversification of livelihood.</li> <li>- Start up support would be necessary.</li> </ul>	<ul style="list-style-type: none"> <li>- Skills exist amongst women in many communities.</li> <li>- Palmyra grows locally in large amounts (though not necessarily in the poorest fishing communities)</li> </ul>	<ul style="list-style-type: none"> <li>- Competition with businesses that currently have the monopoly and operate exploitative labour practices might prove impossible.</li> </ul>

<b><i>Eco-enterprise cont.</i></b>	<b><i>Strengths</i></b>	<b><i>Weaknesses</i></b>	<b><i>Opportunities</i></b>	<b><i>Threats</i></b>
Marketing of non-plastic alternatives	<ul style="list-style-type: none"> <li>- Cooperative marketing might give the poor producers sufficient clout to compete with other producers.</li> </ul>	<ul style="list-style-type: none"> <li>- Market knowledge may be absent amongst stakeholders involved.</li> <li>- Gender discrimination might make it difficult for women's organisations to compete.</li> </ul>	<ul style="list-style-type: none"> <li>- Could be organised through the Federation of Self Help Groups organised by the Dhan Foundation.</li> </ul>	<ul style="list-style-type: none"> <li>- Fairly traded and cooperatively marketed products may not prove economically viable in competition with products produced exploitatively.</li> </ul>
Production of bio-fertilisers	<ul style="list-style-type: none"> <li>- Biodegradable waste is available in huge quantity (waste food, banana leaf plates, vegetable peelings, etc.).</li> <li>- Turns a current problem into a resource.</li> <li>- Cheap and easy enterprise to undertake.</li> <li>- No special equipment of infrastructure necessary.</li> <li>- No need for imported materials (unless worm compost of Effective Micro-organisms were used and imported).</li> </ul>	<ul style="list-style-type: none"> <li>- Start up support would be necessary.</li> <li>- Local demand for bio-fertiliser may be low since the sandy soils are unsuitable for many forms of agriculture</li> </ul>	<ul style="list-style-type: none"> <li>- Technology and precedents for marketing products exist</li> </ul>	<ul style="list-style-type: none"> <li>- Markets may not be available close enough to make production economically viable.</li> </ul>
Bicycle rental enterprise with bicycle workshop for women	<ul style="list-style-type: none"> <li>- Women could easily learn bicycle maintenance, as it doesn't require literacy.</li> <li>- Could form a side-line business instead of taking up time from major livelihood activities.</li> </ul>	<ul style="list-style-type: none"> <li>- May be shortage of cycles needing maintenance outside the tourist off-season.</li> <li>- Cycles may be relatively expensive for women to invest in. Start up support would be necessary.</li> </ul>	<ul style="list-style-type: none"> <li>- Many foreign tourists already hire bicycles from Rameshwaram but if this enterprise were associated with the yoga ashram at Ramakrishnapuram, tourists staying there would prefer to rent from there.</li> </ul>	<ul style="list-style-type: none"> <li>- May be competition with existing bicycle rental shops.</li> </ul>
E-mail & internet facility for tourists	<ul style="list-style-type: none"> <li>- High demand for e-mail facilities amongst foreign tourists nowadays.</li> <li>- If yoga ashram were developed the centre would have a 'captive market'.</li> <li>- If the enterprise generated sufficient revenue more computers could be purchased for the computer education centre</li> </ul>	<ul style="list-style-type: none"> <li>- Initially tourist use of internet facilities might conflict with community use.</li> </ul>	<ul style="list-style-type: none"> <li>- One skilled computer operator is found amongst the women of Ramakrishnapuram and another woman from the community is studying computer engineering.</li> <li>- Ashram computer centre is being established with two computers donated from MSSRF.</li> </ul>	<ul style="list-style-type: none"> <li>- Computers being donated to the ashram may be obsolete models, which are too slow for effective internet access.</li> </ul>

<b><i>Eco-enterprise cont.</i></b>	<b><i>Strengths</i></b>	<b><i>Weaknesses</i></b>	<b><i>Opportunities</i></b>	<b><i>Threats</i></b>
Women's cooperatives to make tourist trinkets and materials for worship in the temple	<ul style="list-style-type: none"> <li>- Shell handicrafts and temple offerings such as cotton wicks for oil lights, sesame tied in cotton and soaked in oil, and palm leaf baskets are produced locally by women and have a market.</li> <li>- Credit facilities made available through the Federation of Self Help groups might enable small community-based women's coops to buy materials in bulk to organise their own enterprise</li> </ul>	<ul style="list-style-type: none"> <li>- Shells need to be polishes using special chemicals and a techniques which are currently unavailable to women artisans.</li> <li>- Women usually can't afford to buy shells in bulk for handicraft production.</li> </ul>	<ul style="list-style-type: none"> <li>- Dhan Foundation's Federation of Self Help Groups is already linking women from many different communities in the region through community banking.</li> <li>- Cooperative production and marketing of handicrafts would be relatively easy to develop through these institutions.</li> </ul>	<ul style="list-style-type: none"> <li>- Monopolies held by large handicraft businesses on materials, labour and markets may be impossible to break down.</li> <li>- Cooperatively produced products employing fair labour practices might be unable to compete with products produced exploitatively.</li> </ul>
Apiculture and beeswax enterprise	<ul style="list-style-type: none"> <li>- Bee forage is plentiful (coconut, palmyra, banana, acacia).</li> <li>- Beekeeping does not require land so landless fishers could easily undertake it.</li> <li>- Does not require large investment in equipment or stock to start.</li> <li>- Cheap to maintain, minimal costs on sugar feeding are the only ongoing expenditure.</li> <li>- Honey has a local good market Rs400/ litre.</li> <li>- Value addition with development of beeswax enterprise (skin creams and candles) or development of ayurvedic medicines containing honey and local herbs has potential.</li> </ul>	<ul style="list-style-type: none"> <li>- Drought conditions may limit nectar availability in the hot season and heavy rains might stress bee colonies in the monsoons.</li> <li>- No tradition of keeping bees amongst fishing communities.</li> <li>- Most traditional practices involve unsustainable honey hunting and not beekeeping.</li> </ul>	<ul style="list-style-type: none"> <li>- Appropriate technology and bee breeding techniques using locally available indigenous <i>Apis cerana</i> have been developed in the region (by Palni Hills Conservation Council).</li> <li>- High quality and appropriate technical advice is available.</li> </ul>	<ul style="list-style-type: none"> <li>- Thai Sac Brood Virus could affect production.</li> <li>- Fishers may not be interested.</li> </ul>

<b><i>Eco-enterprise cont.</i></b>	<b><i>Strengths</i></b>	<b><i>Weaknesses</i></b>	<b><i>Opportunities</i></b>	<b><i>Threats</i></b>
Small scale low-cost solar fish driers	<ul style="list-style-type: none"> <li>- Fish drying is a traditional occupation of fishers, especially women.</li> <li>- The technology would prevent fish putrefaction whilst drying and improve the environment for tourism because of fewer bad smells</li> <li>- 'Trash catch' small fish are available from trawlers and might be obtained cheaply.</li> <li>- Certain species are good for drying for consumption in the lean seasons and the proposed technology would enable more hygienic production of them.</li> <li>- More hygienically dried fish might enable a local market in dried fish to establish.</li> </ul>	<ul style="list-style-type: none"> <li>- Initial start-up costs of establishing solar driers might be expensive, requiring outside inputs.</li> <li>- Small-scale units are less likely to be viable than larger scale ones.</li> </ul>	<ul style="list-style-type: none"> <li>- Technology for solar drying of fish exists in India and is well developed.</li> <li>- Fisherwomen's cooperative Societies or Federations of Self Help Groups could organise fisherwomen to cooperate in the establishment and management of such enterprises and may provide initial credit.</li> <li>- Excess fish are available to fisherwomen for much of the year.</li> </ul>	<ul style="list-style-type: none"> <li>- Markets for higher quality dried fish may not be competitive.</li> </ul>
Organisation of female guides and taxi / auto-rickshaw drivers for women travellers	<ul style="list-style-type: none"> <li>- New tourism product with special appeal to lone women foreign tourists.</li> <li>- Many women (Indian and foreign) might prefer female guides and to travel in vehicles driven by women.</li> <li>- New way of diversifying women's livelihoods.</li> </ul>	<ul style="list-style-type: none"> <li>- Few women may get the opportunity to learn driving and acquire a driving license.</li> <li>- Taxis are difficult to come by - i.e. too expensive for the poor to buy and may possibly not be provided to women through existing male-dominated taxi / auto-rickshaw companies.</li> <li>- Training in guiding and in English necessary for women.</li> </ul>	<ul style="list-style-type: none"> <li>- One female driver is found on near Rameshwaram, trained with the help of Swami Pranavananda.</li> <li>- She already takes female foreign tourists on guided tours occasionally.</li> </ul>	<ul style="list-style-type: none"> <li>- Associations of male taxi drivers and tourist guides may make it difficult for women to enter the field.</li> </ul>
Neem processing	<ul style="list-style-type: none"> <li>- Neem grows very well all along the coast (not on beaches but just inland).</li> <li>- Easy to grow.</li> <li>- Not time consuming to maintain.</li> <li>- Under-used resource.</li> <li>- Neem has an enormous number of applications.</li> </ul>	<ul style="list-style-type: none"> <li>- Neem is not found on the land where the poorest fishers live (tends to be slightly inland).</li> <li>- Appropriate processing systems may be expensive.</li> </ul>	<ul style="list-style-type: none"> <li>- Neem is there already.</li> <li>- Technology for processing neem is well established in India.</li> <li>- Biopesticides using neem are becoming more popular.</li> </ul>	<ul style="list-style-type: none"> <li>- Market for neem products may not be there.</li> </ul>

## 9 Analysis of General Barriers to Ecotourism and Eco-enterprise in the Gulf of Mannar

<i>Issue</i>	<b>Ways in which it forms a barrier to ecotourism or eco-enterprise development</b>	<b>Means of overcoming this barrier</b>
<p><i>Regulations &amp; red tape</i></p>	<p>The government regulations of the Forestry Department restricting access to 20 of the islands in the Gulf of Mannar, the Fisheries Department restrictions upon access to Krusadai island and the Coast Guard restrictions to boating in the Gulf of Mannar are perhaps the most severe barriers to the development of ecotourism products involving boating, snorkelling, SCUBA diving, nature walks, and the like in the Gulf of Mannar. In addition land regulations and regulations limiting development of enterprises prevent the landless poor from developing enterprises in their place of residence. In Rameshwaram government regulations prohibit the establishment of any foreign exchange counter. This severely inconveniences foreign tourists.</p>	<p>Pressure groups need to be formed and / or mobilised to advocate for changes in regulations such that careful and controlled tourism development is allowed to develop. Such changes should still enable the Coast Guard to maintain security and the Forestry Department to uphold the 1972 Wildlife Protection Act. However, diversification of use of marine resources away from purely extractive fishing, which is severely damaging biodiversity, towards wildlife viewing needs to become possible by changing regulations. It may be necessary to make a special-case regulatory body comprising all three government departments and other stakeholders at different levels for this process to become possible. This has already been attempted in the formation of a committee for the management of the biosphere reserve, but since this committee has so far never met and had not been given any legal regulatory responsibilities so far it is effectively non-existent.</p> <p><i>Resurrection of this committee or formation of a new one with legal clout of its own is a matter of utmost priority not only for the development of the products and enterprises suggested here but also for the development of a sustainable and effective management plan for the marine biosphere reserve.</i></p>
<p><i>Lack of infrastructure.</i></p>	<p>Lack of good quality roads down the coast between Mandapam and Thuthukodi (Tuticorin) and lack of hotels and restaurants severely limit tourist traffic in these areas. Sanitation and waste disposal systems are totally lacking in most areas. Even in Rameshwaram lack of effective waste disposal and sewage treatment systems leads to pollution of the sea and unsightly and unhygienic rubbish dumps scattered all around. Similarly drainage systems are blocked and smelly, deterring tourists from staying in certain lodges. In most of the villages along the coast lack of potable fresh drinking water is a massive problem and a major barrier to development of tourism facilities.</p>	<p>If tourism products are to be developed down the coast or on any of the islands south of the Krusadai cluster, improvement and expansion of the east coast road system is crucial. Similarly effective sewage treatment systems to avoid pollution of the biosphere reserve waters <i>must</i> be introduced, especially in the populated tourist centre of Rameshwaram. In villages composting toilets that require very little water, shallow pits and only need organic material such as dry coconut leaves to function should be introduced on a large scale. General improvements in drainage systems and drinking water supplies are also called for on a large scale.</p>

<b>Issue (cont.)</b>	<b>Ways in which it forms a barrier to ecotourism or eco-enterprise development</b>	<b>Means of overcoming this barrier</b>
<i>Lack of human capital of the poor – e.g. skills</i>	Traditional fishermen and fisherwomen in the communities along the coast and the rural people living a little inland lack skills for eco-enterprise and ecotourism. Generally they are skilled at certain types of fishing and fishing related skills (net manufacture and maintenance, processing of fish and bye-catch, seaweed diving, chank diving, etc.). In some communities where palmyra trees and / or coconuts are abundant many are skilled in palmyra basket / mat weaving and coconut thatching. Some women are skilled in shell handicraft making.	Skill development training in each of the eco-enterprises suggested, using materials locally available to communities wherever possible, should be a major part of any intervention. Similarly training in basic hygiene and sanitation, compost toilet making and usage, hygienic cooking, simple tea stall or small hotel management, guiding for religious tours and nature tours, snorkelling and SCUBA diving with strong emphasis on safety regulations and on identification of wildlife will be necessary.
<i>Lack of social capital / organisational strength</i>	Fishermen's Cooperative Societies and Fisherwomen's Cooperative Societies exist and have some power (e.g. organising strikes of fishers when working conditions or pay become unacceptable). However their capacity for organising credit for fishermen or negotiating in multi-stakeholder forums appears to be limited. Within communities there are few organisations that take on the concerns of all parties. Many existing organisations are biased by religion (church organisations, mosque related groups) or by political allegiance (e.g. communist party and other groups). There appeared to be underlying conflict between different groups in most of the villages visited.	Capacity building of fishers cooperative societies, women's self help groups and other community-based organisation (CBOs) as well as of tourist guide associations, hotel associations etc needs to be undertaken. The approach to strengthening such local institutions should not only increase the ability of the institutions to protect their own member's interests, provide credit and other forms of support, but should also provide training in conflict resolution approaches and resource management issues.
<i>Lack of awareness about the biosphere reserve</i>	Less than 50% of those on the coast of the Gulf of Mannar are aware of the biosphere reserve's existence and elsewhere awareness is negligible, even amongst educated sectors of society (TATA & SSFRD 1998).	Large scale awareness and education programmes about the Gulf of Mannar Marine Biosphere Reserve in schools, universities, with local communities and tourists in the Gulf of Mannar is crucial if support for conservation objectives to be attained. Development of an interpretive centre in Rameshwaram would also assist this process. Posters and promotional material, using school children's participation in the form of poster competitions, should be developed and widely distributed.

<b>Issue (cont.)</b>	<b>Ways in which it forms a barrier to ecotourism or eco-enterprise development</b>	<b>Means of overcoming this barrier</b>
<i>Lack of land ownership / tenure</i>	Most c.70% of the people on the coast of the Gulf of Mannar are landless especially the fishers who live close to or on the beach. This makes it very difficult for them to start any formalised/ government approved enterprise since it is required to show land documents for a location before developing any enterprise upon it. This makes it particularly difficult to put huts for tourists on the beach and get them approved as tourist accommodation for example.	Changes in regulations concerning use of beaches or of land upon which a family has been living for a certain length of time need to be instigated. This could involve relaxation of certain rules or perhaps some special agreement between certain communities and the Forest department. Advocacy by NGOs, CBOs and the Federation of SHGs or by pressure groups may be needed to assist this process.
<i>Low capacity to meet tourist expectations</i>	Most of the village people, except those in the immediate vicinity of Rameshwaram (e.g. Sankumal village) lack awareness of what tourism is and what tourists might need or expect. They have little education have had very limited opportunity to interact with tourists. Hygiene and sanitation in the local community is lacking and use of beaches as common toilets appears to be the norm.	For the development of village tourism and for poorer people to access jobs as tourist guides, nature guides, boat operators and so on, training about tourism should be provided through a programme to develop the various ecotourism products listed above. Training should explain what kind of interests and concerns different groups of tourists have, especially foreign tourists whose expectation as may be quite different from those assumed by community members. Training as listed in the section above on 'lack of human capital' (e.g. skills) should be provided. In addition, a major sanitation programme of building and USING compost toilets in coastal villages as well as beach clean-up programmes removing rubbish and unsightly rotting trash catches.
<i>Lack of linkages between formal and informal sectors / local suppliers</i>	Currently formal sectors such as the Tamil Nadu Tourism Development Corporation and the registered hotels and lodges have poor linkages with the informal sectors providing boating facilities, village tourism opportunities or guided tours. Some of the foreign guides have attended training and have certain linkages with hotels but animosity exists between lodge owners and informal village tourism operators because of the lack of registration of the latter and the fact that they draw foreign tourists away from the lodges, depriving them of business. Similarly in the handcraft business, 4 large companies tend to control production and marketing of local shell handicrafts and baskets for tourists, excluding small-scale operators from the market. Poor fishers also fail to sell their fish on the open market due to exploitative buy back agreements with fish traders-cum-moneylenders who offer them poor prices.	Promotion of 'fair-trade' practices in the tourism industry needs to be developed with a system of authorisation or certification of those who practice more equitable fair trading and employment. This requires education and awareness raising amongst tourists (Indian and foreign), so that they demand fairly traded products and services, coupled with changes in the formal tourism sectors to welcome such changes (since ultimately they should improve their businesses despite initial potential losses). In restaurants and fish markets line-caught fish or fish caught from country crafts NOT using destructive and unsustainable trawling methods could be certified and marketed as such, allowing consumers to choose more sustainable products. Strengthening of linkages requires changes in consumer behaviour / demand which would then fuel a change in attitude of authorities and formal sector actors in tourism markets.

<b>Issue (cont.)</b>	<b>Ways in which it forms a barrier to ecotourism or eco-enterprise development</b>	<b>Means of overcoming this barrier</b>
<i>Lack of financial capital of the poor</i>	Many of the poor communities on the coast are dependent upon moneylenders / fish traders for credit to buy boats and fishing tackle and to meet basic food and other basic requirements during the off seasons for fishing. These relationships are always exploitative tending to trap the poor in vicious circles of indebtedness.	The work of the Dhan Foundation and the Federations of Self Help Groups in the Gulf of Mannar region is a key step already being taken to reduce dependence of poor fishing communities upon moneylenders and fish traders. Already some Self Help Groups (for savings and credit purposes) have been formed and they have joined the Federation, enabling them to access more and more credit. These activities need to be expanded to all communities and strengthened over time to provide micro-credit for small business and for managing in the off-seasons to as many as possible.
<i>Lack of stakeholder participation</i>	Currently the many stakeholders affected by resource use and tourism in the Marine Biosphere Reserve have no opportunity to participate in decision making about how resources are used and what kind of regulations imposed. This leads to a situation where many stakeholders break rules and regulations designed to conserve biodiversity and either bribe their way out if intercepted or they avoid interception. A multi-stakeholder committee for management of the Marine Biosphere Reserve has been formed on paper but nothing has happened in practice.	A participatory multi-stakeholder approach to develop community-based sustainable fisheries management, along the lines of that developed in Malaysia (see Salim 1998 and Yadava 2001) is <i>central</i> to development of ecotourism, eco-enterprise and sustainable management of the Marine Biosphere Reserve. Experiences and expertise from BOBP, Malaysia and the Maldives need to be drawn upon in developing these.
<i>Planning process favours others – lack of planning gain</i>	The poorest communities, due to lack of government approved documents (especially land documents) have problems in registering any new economic activity as 'government approved'. This 'lack of planning gain' severely blocks opportunities for the poor to plan new enterprises.	Participatory planning processes in villages, perhaps using Appreciative Participatory Planning and Action (APPA), should be undertaken by NGOs active in the area working through existing Self Help Groups and using their micro-credit facilities for micro-finance of small enterprises. This MUST be coupled with capacity building of local government (at Panchayat, District and State levels) in participatory planning to enable village level entrepreneurs to present their plans and have them approved. Changes in laws or regulations may be necessary to influence planning in this way. Such changes would demand advocacy by panchayat officials, NGOs, members of parliament and other influential persons.

<i>Issue (cont.)</i>	<b>Ways in which it forms a barrier to ecotourism or eco-enterprise development</b>	<b>Means of overcoming this barrier</b>
<i>Intra- and inter- sectoral conflicts</i>	<p>The competition for the declining fishery resources in the Gulf of Mannar means that conflict between various stakeholders, especially the mechanised and traditional fisher people, is increasing.</p> <p>Even between government departments of Forest, Fisheries and Coast Guard conflict exists over who should have ultimate control and this causes problems in the management of the area.</p>	<p>Through capacity building of stakeholders' own organisations, it is important to enable stakeholders to see other stakeholders' points of view and to help them to seek resolution rather than escalating conflict. Initially it will be necessary to work with individual stakeholder groups to understand their concerns and help them to express them. Later once intra-sectoral consensus has been achieved, introduction to the issues facing other stakeholders is necessary. Finally once some understanding of each other's positions has been possible, face-to-face exchange between stakeholder groups can be introduced. This should result in formation of multi-stakeholder coalitions with explicit commitment to address <i>all</i> stakeholder's interests and the main common interest of sustainable resource use.</p>
<i>Gender norms &amp; constraints</i>	<p>In many fishing communities women are marginalised. Many (but not all) fishing communities traditionally exclude women from fishing activities and involve them in the processing and maintenance side of the work (drying fish, fish marketing, net mending and cleaning, shell and other by-catch sorting, etc). This means that women are either under-employed or under- or not remunerated for their contribution to fishing work. Women want some economic independence from their men folk and opportunities to diversify their livelihoods. However lack of time to undertake new enterprises due to the very slow and tedious job of cleaning and mending nets makes this difficult for them.</p> <p>In addition to gender inequities within their families and communities, women face exploitation from males in outside institutions. Reports of rape and sexual harassment by forest guards of women collecting firewood and by moneylenders demanding their repayment are examples of the everyday oppression that village women face when dealing with those in authority above them.</p> <p>These forms of disempowerment make it very difficult for women to undertake any new enterprise, especially in tourism, which has a bad reputation due to the large-scale sex tourism trade in India and elsewhere in Asia.</p>	<p>Gender awareness raising with women and men (first separately and later together) needs to be undertaken as a matter of priority. This is the case in all fishing communities and the farming communities inland. In addition, gender mainstreaming needs to be undertaken in all NGOs and government institutions in order for gender issues to be better understood and for gender equity to be promoted. Currently gender issues are thought of as 'women's issues' and this leads to suspicion amongst men. The benefits to <i>all</i> of increasing gender equity need to be better understood and communicated to all sectors of society. In addition to this the legal status of women needs strengthening and women should be made better aware of their legal rights. Punishment for rape and sexual harassment and better mechanisms for policing and dealing with abusers need to be developed so that women can come forward to defend their legal position.</p> <p>Education of communities about tourism enterprise opportunities that are not sexually exploitative of women, coupled with strong community and police commitments to discourage sex tourism, might make it easier for women to become involved in tourism-related enterprises.</p>

<i>Issue (cont.)</i>	<b>Ways in which it forms a barrier to ecotourism or eco-enterprise development</b>	<b>Means of overcoming this barrier</b>
<i>Lack of pro-active govt support</i>	The government has no policies that encourage the participation of the poor in the tourism sector. Generally government regulations and red tape form barriers for the poor to participate and there is not even any rhetoric about supporting involvement of the poor.	Change in government policy through advocacy and pressure from international donors and international tourism industry actors is necessary for ecotourism with a true 'pro-poor focus' to develop in India. Domestic political and social pressure is also necessary, especially through Indian NGOs and environmental pressure groups.
<i>Tourist safety</i>	There have been a number of boating accidents in the Gulf of Mannar. Near Krusadai island a boat capsized and around 20 students were drowned. Similarly, near Nallanthanni Island, where the seas are notoriously rough, one tourist drowned when a boat capsized and another drowned when swimming near the shore. This has been very off-putting to fishing communities interested in taking tourist boating trips. Life-belts and life-buoys are not customary in the boats that currently are used for tourist trips (i.e. ordinary fishing boats). Although the people of the fishing communities tend to be string swimmers the same cannot be said for the average Indian tourist who might be interested in a boat trip, and even those who swim may be inexperienced in swimming in the sea with its associated currents and tides.	In the development of ecotourism activities like boat trips, snorkelling, SCUBA diving, basic safety equipment and procedures are pre-requisites to a successful enterprise. Accidents, apart from causing deaths and injuries, can quickly ruin the reputation of a destination or product. For boat trips, well-maintained boats and life jackets for all passengers including children are essential. Similarly, training in safe snorkelling practices and especially SCUBA diving practices should be obligatory for all boat trip operators and tourists.
<i>Tourist market (segment) inappropriate</i>	The current tourism market segment in the Gulf of Mannar is most commonly Indian religious pilgrims, mainly from within Tamil Nadu but also from North India and other states of South India. Generally these tourists are interested mainly in fulfilling their religious duties and then moving on rapidly. Most stay less than one day in Rameshwaram and move out of the Gulf of Manar area. For a large proportion of pilgrims the worship of their ancestors ( <i>shradhaye</i> ) is the main focus of their visit. In this case it is considered inauspicious to stay in the same location that the ritual ( <i>puja</i> ) was performed. This means that many try to leave as soon as they have completed their duties and either return home or move on to another location (such as Madurai). Such religious pilgrims are unlikely to be tempted to undertake leisure tourism activities, even if more opportunities were to be developed. However, other religious pilgrims (e.g. couples coming to pray for the birth of children) are not subject to these restrictions and might stay longer were more attractions made available to them. Amongst foreign tourists, the market segment tend to be independent low to medium budget tourists who would be highly appropriate customers for village tourism and ecotourism activities such as snorkelling.	Once ecotourism products are being developed marketing of the area and the products amongst new specific ecotourists from both within India and abroad would be necessary. Whilst certain products (especially those produced at the start) should definitely focus upon the existing market segment, as these products become established, products for the more 'experienced ecotourist' should be developed and marketed. Increased numbers of foreign tourists bringing foreign currency into the region would be very helpful to increasing revenues from ecotourism. Similarly encouragement of the richer tourists (both Indian and foreign) by development of more 'luxury' well appointed resorts would be advisable, so long as such resorts made a commitment to employment of local people and certain fair trading and neighbourhood friendly practices.

<b>Issue (cont.)</b>	<b>Ways in which it forms a barrier to ecotourism or eco-enterprise development</b>	<b>Means of overcoming this barrier</b>
<i>Inadequate access to the tourism market</i>	Most of the poor fishing communities and even the better off people outside Rameshwaram area do not have access to the tourism market because most tourists only visit this area. Even in Rameshwaram itself the poor only have options to work as illegal road side or wandering vendors who are regularly forced to move on by police.	Development of village tourism products and eco-enterprises should help to provide the poor with better access to tourism markets. The shining example of Swami Pranavananda's advocacy, establishing linkages between foreign tourists and women in his community needs to be replicated elsewhere. He has especially trained one woman as a taxi driver and tourist guide for female tourists and also several women who can accommodate female foreigners as paying guests in their homes. An association of village ecotourist operators may need to be established and marketing of their enterprises initially facilitated by NGOs and the Tamil Nadu Tourism Development Corporation.
<i>Lack of "product"</i>	The Ramanathaswamy temple with its nearby holy beach and some of the other religious sites nearby, such Kodanarama Temple, Sita Tirtham, Rama Tirtham and Laxman Tirtham are 'established' tourist products at this point in time. Government restrictions on landing on or boating around the 21 islands, plus a lack of suitable boats and safety equipment for transporting tourists means that snorkelling and boating 'products' have not been able to establish. Further down the coast lack of infrastructure and market development has prevented the growth of tourism products, despite some beautiful locations. Closer to Thuthukodi (Tuticorin) industrial pollution and destruction of coral islands by coral mining makes development of tourism products less appropriate.	Potential products of natural beauty do exist in the Gulf of Mannar region. These should be developed through coordinated efforts of Forestry, Fisheries and Coast Guard departments to make regulations amenable to allowing tourists access to certain islands and areas of seas (with strict limits of the numbers of tourists and the types of activity allowed). Once the necessary regulatory mechanisms are in place, private sector businesses and community enterprises supported by NGOs should develop a variety of products as listed in section 7. The Tamil Nadu Tourism Development Corporation could then support these by developing promotional materials about the area and the new products and providing information in its tourist information centres.
<i>Incompatibility with existing livelihood strategies</i>	The existing livelihood strategies of many of the communities along the coast are entirely dependent upon marine resources (fishing, shell collection etc). This means that land based livelihood options may be incompatible. Certainly working within the tourism industry (e.g. as employees in hotels or restaurants) may deplete family workforce in fishing during the crucial seasons such that it is difficult to maintain both activities. The SW monsoon (June to August) is the main off-season for fishing and due to the rain this tends also to be the low season for national leisure tourism and foreign tourism. Similarly fishers are busy with their fishing in tourism peak seasons.	The only way that incompatibility with fishing livelihoods can be overcome as a barrier to ecotourism and to eco-enterprise is for such enterprise to provide enough revenue that fishing no longer becomes necessary at the times when tourism or eco-enterprise is in season. This is indeed the aim of introducing the alternative livelihoods so that pressure is reduced on marine fishery resources and conflicts resolved. In order for new livelihoods to compensate for loss of earning through fishing, subsidies and / or low interest credit facilities will need to be available during the start-up period of enterprises.

<i>Issue (cont.)</i>	<b>Ways in which it forms a barrier to ecotourism or eco-enterprise development</b>	<b>Means of overcoming this barrier</b>
<i>Security issues</i>	The waters of the Gulf of Mannar form a haven for Sri Lankan refugees and in particular Tamil Tigers fleeing to safety. The Coast Guard has responsibility to protect India's shores from illegal immigration and smuggling.	Regulations enabling tourist leisure boats to function in clearly defined areas and limited numbers need to be introduced. Communications between coast guards and other boats need also to be improved so that any suspicious unauthorised boat users could be intercepted.
<i>Location</i>	The Gulf of Mannar has beautiful blue sea, inviting beaches, fresh sea air and fascinating biodiversity. In addition Rameshwaram and Dhanushkodi are enormously important places for Hindu pilgrimage. The Ramanathaswamy temple is visited by millions of Indian pilgrims each year. Despite the unspoilt beauty of the coastline and waters, only the holy town of Rameshwaram and its Ramanathaswamy temple and nearby Dhanushkodi are well-established tourist destinations in the Gulf of Mannar. Many of the other beautiful locations along the coast are remote in the sense that road access to them is very poor.	Road building and improvements in infrastructure and tourist facilities are necessary pre-requisites to developing new locations for tourism on the coast of the Gulf of Mannar. Once infrastructure development gets underway the Tamil Nadu Tourist Development Corporation needs to promote other locations in the Gulf of Mannar as tourist destinations.

## 10 Prioritisation of potential ecotourism products and eco-enterprises

Now that the potential products and enterprises have been described and the strengths, weaknesses, opportunities and threats to each have been analysed, and the general barriers to development have been analysed, it is necessary on the basis of all this information to prioritise them under the four headings (educational tourism, religious tourism, nature / leisure tourism and eco-enterprise). In order to do this a prioritisation analysis has been prepared (Table 2). This includes for each product or enterprise a list of potential stakeholders who might be involved, types of input that might be required, the key factors influencing its success or feasibility, a very rough feasibility index, a rating for its 'pro-poor' qualities and a rating for its environmental impact. The feasibility index is based on discussion with stakeholders in the field, results of the SWOT analysis and the author's experience, but is NOT based on economic calculations since these could not be collected in the time available. It aims to allow the reader to compare different enterprise options at an initial stage but will need verifying through exact market analysis and through detailed participatory interactions and business planning in the field.

The feasibility index ranks are as follows:

- 5 - Feasible and highly likely to be successful;
- 4 - Probably feasible and likely to succeed;
- 3 - May be feasible and successful - needs careful analysis to find out;
- 2 - Not very likely to be feasible but the idea warrants investigation;
- 1 - Probably not feasible though the idea warrants further investigation;
- 0 - Not feasible at all at this time

A 'pro-poor rating' of each product or enterprise in terms of its potential pro-poor impacts, should barriers to its development be overcome making it feasible, is also given as follows:

- \*\*\* - Highly desirable (will greatly benefit the poor)
- \*\* - Desirable (should provide net benefits to the poor)
- \* - Acceptable (should not impact negatively on the poor but may not benefit them)

The potential environmental impact of the products and enterprise is summarised under the following categories:

- A\* = very positive i.e. substantial net environmental benefits
- A = positive i.e. net environmental benefits
- B = neutral i.e. should have no negative impacts *if properly managed*
- C = possibly negative i.e. has potential to impact negatively on the environment
- D = negative i.e. will most likely impact negatively on the environment

**Table 2. Prioritisation of potential ecotourism products and eco-enterprises on the basis of estimated feasibility, stakeholder involvement and necessary inputs.** An indication of how desirable they might be and the key factors affecting success or failure are summarised.

**i) Educational tourism products**

<i>Rank</i>	<i>Product or enterprise</i>	<i>'Pro-poor' rating</i>	<i>Environmental impact rating</i>	<i>Key stakeholders to be involved</i>	<i>Most Important Inputs necessary</i>	<i>Key factors affecting success or failure</i>	<i>Feasibility index</i>
1	Interactive CD Rom cum Website on Gulf of Mannar	*	A	<ul style="list-style-type: none"> <li>- Private sector computer education specialist to compile the CD Rom</li> <li>- Scientists with knowledge on GOM</li> </ul>	<ul style="list-style-type: none"> <li>- Funds (grant)</li> <li>- Scientific, historical and other information</li> </ul>	<ul style="list-style-type: none"> <li>- Promotion of the CD Rom / website</li> <li>- Provision of computers for public access to the website</li> </ul>	5
1	Interpretive centre on the Gulf of Mannar	**	A	<ul style="list-style-type: none"> <li>- Fisheries Department</li> <li>- Forest Department</li> <li>- Tamil Nadu Tourism Development Corporationn</li> <li>- Tourist users of the centre</li> <li>- Tourism sector actors (e.g. nature guides, boat operators, snorkelling trip organisers, village resort representatives, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>- Land / building</li> <li>- Funds</li> <li>- Scientific and educational specialists' input in preparing interpretive material</li> </ul>	<ul style="list-style-type: none"> <li>- Cooperation between government departments to establish it</li> <li>- Ongoing funding to maintain and run it</li> <li>- Effective promotion</li> <li>- If the place acts as a nodal point for different tourism workers the poor would benefit more</li> </ul>	4
2	Field study centre in Krusadai Island	**	B	<ul style="list-style-type: none"> <li>- Fisheries Department</li> <li>- Forest Department</li> <li>- School, universities</li> <li>- Scientists</li> <li>- Boat operators</li> <li>- Pamban village people who might provide food</li> </ul>	<ul style="list-style-type: none"> <li>- Funds for renovation of facilities</li> <li>- Safety equipment for visitors on boats</li> <li>- Technical advice for museum renovation</li> <li>- Permission from Fisheries and Forest departments</li> </ul>	<ul style="list-style-type: none"> <li>- Resolution of dispute between Fisheries and Forest Depts about the island</li> <li>- Responsible use by visitors (adherence to codes of conduct)</li> </ul>	4
3	Student conservation volunteer holidays	*	A	<ul style="list-style-type: none"> <li>- Interested students</li> <li>- Colleges and universities providing training in biological studies</li> <li>- Tutors in conservation studies</li> </ul>	<ul style="list-style-type: none"> <li>- Funds for conservation activities</li> <li>- Quality advice on necessary conservation measures</li> <li>- Tuition for volunteers</li> </ul>	<ul style="list-style-type: none"> <li>- Fisheries and Forest Departments permission to allow volunteers into restricted areas</li> </ul>	4

3	Oceanarium	*	B	<ul style="list-style-type: none"> <li>- Fisheries Department</li> <li>- Forest Department</li> </ul>	<ul style="list-style-type: none"> <li>- Accommodation</li> </ul>	<ul style="list-style-type: none"> <li>- Availability of Funds</li> <li>- Suitable location</li> <li>- Quality advice</li> <li>- Financial viability</li> </ul>	3
4	Modernisation and upgrading of the museum and aquarium of the CMFRI	*	B	<ul style="list-style-type: none"> <li>- Private sector entrepreneurs</li> <li>- CMFRI scientists</li> <li>- Technical specialists on marine life husbandry, safety etc.</li> <li>- Visitors to attraction</li> <li>- Fisheries Department</li> <li>- Forest Department</li> </ul>	<ul style="list-style-type: none"> <li>- Land</li> <li>- Funds</li> <li>- Scientific and educational specialists' input in preparing interpretive material, husbandry procedures and safety</li> </ul>	<ul style="list-style-type: none"> <li>- Willingness of CMFRI to attract more students</li> <li>- Survival of CMFRI as an institution</li> </ul>	2
5	Snorkelling and scuba diving school	*	B	<ul style="list-style-type: none"> <li>- CMFRI</li> <li>- Schools, colleges and universities</li> <li>- Fisheries Department</li> <li>- Forest Department</li> <li>- Private sector entrepreneur</li> <li>- Fisheries Department</li> <li>- Forest Department</li> <li>- User of the school</li> </ul>	<ul style="list-style-type: none"> <li>- Funds</li> <li>- Technical advice on improving exhibits</li> <li>- Scientific input in preparing interpretive material</li> <li>- Funds</li> <li>- Equipment</li> <li>- Technical advice</li> </ul>	<ul style="list-style-type: none"> <li>- Availability of funds for establishment</li> <li>- Demand for tuition in snorkelling and SCUBA diving</li> <li>- Financial viability</li> </ul>	2

## ii) Religious tourism products

<i>Rank</i>	<i>Product or enterprise</i>	<i>'Pro-poor' rating</i>	<i>Environmental impact rating</i>	<i>Key stakeholders to be involved</i>	<i>Most Important Inputs necessary</i>	<i>Key factors affecting success or failure</i>	<i>Feasibility index</i>
1	Package tour of religious sites	*	C	<ul style="list-style-type: none"> <li>- Tour operators</li> <li>- Temple authorities</li> <li>- Temple guides</li> <li>- General tourist guides</li> <li>- Handicraft and tourist trinket vendors</li> </ul>	<ul style="list-style-type: none"> <li>- Good buses</li> <li>- 4-wheel drive vehicles to reach Dhanushkodi</li> <li>- Good well trained informative guides</li> </ul>	<ul style="list-style-type: none"> <li>- Financial viability</li> <li>- Resolution of conflict over access of vehicles to Dhanushkodi</li> </ul>	5
2	Yoga / meditation ashram in Swami Pranavananda's fishing community	***	B	<ul style="list-style-type: none"> <li>- Swami Pranavananda</li> <li>- Ashram employees</li> <li>- Ramakrishnapuram Community</li> <li>- Women's group</li> <li>- Devotees interested to stay</li> </ul>	<ul style="list-style-type: none"> <li>- Funds for ashram expansion</li> </ul>	<ul style="list-style-type: none"> <li>- Promotion of the ashram to interested devotees</li> </ul>	5
3	Pilgrimage tours to Muniya Swami temple on Nallathanni Island	**	C	<ul style="list-style-type: none"> <li>- Keeha Mundal village fishers</li> <li>- Boat owners</li> <li>- Forest Department</li> <li>- Bus tour operators</li> </ul>	<ul style="list-style-type: none"> <li>- Safety equipment for boats</li> <li>- Permission from Forest Department</li> <li>- Promotion of the place</li> </ul>	<ul style="list-style-type: none"> <li>- Permission to expand numbers of visitors from Forest Department</li> <li>- Improvements to the roads down the coast</li> </ul>	3
4	Renovation of lesser known temples and tanks	*	B	<ul style="list-style-type: none"> <li>- Temple authorities</li> <li>- Construction companies</li> </ul>	<ul style="list-style-type: none"> <li>- Funds for renovations</li> </ul>	<ul style="list-style-type: none"> <li>- Access to funds</li> </ul>	3

### iii) Nature / leisure tourism products

<i>Rank</i>	<i>Product or enterprise</i>	<i>'Pro-poor' rating</i>	<i>Environmental impact rating</i>	<i>Key stakeholders to be involved</i>	<i>Most Important Inputs necessary</i>	<i>Key factors affecting success or failure</i>	<i>Feasibility index</i>
1	Fish barbecues around fires on the beach	***	B	<ul style="list-style-type: none"> <li>- Fisher people (e.g. of Sankhumal village)</li> <li>- Tourists</li> <li>- Police / Coast guard</li> <li>- Forest Department</li> </ul>	<ul style="list-style-type: none"> <li>- Interest amongst tourists</li> </ul>	<ul style="list-style-type: none"> <li>- Permission from forest department and coast guards</li> <li>- Publicity amongst tourists</li> </ul>	5
1	Snorkelling boat trips to coral near Sankumal village	***	B or C	<ul style="list-style-type: none"> <li>- Boat operators</li> <li>- Forest Department</li> <li>- Coast Guard</li> <li>- Tourists interested in snorkelling or boat trips</li> </ul>	<ul style="list-style-type: none"> <li>- Snorkelling equipment</li> <li>- Safety equipment</li> <li>- Training in nature guiding</li> <li>- Permission from authorities</li> </ul>	<ul style="list-style-type: none"> <li>- Permission</li> <li>- Survival of the coral</li> </ul>	4
2	Glass-bottomed boat trips to coral areas.	*	B or C	<ul style="list-style-type: none"> <li>- Boat operators</li> <li>- Forest Department</li> <li>- Coast Guard</li> <li>- Tourists interested in boat trips to view nature</li> </ul>	<ul style="list-style-type: none"> <li>- Specialised boat</li> <li>- Safety equipment</li> <li>- Training in sea life identification for guides / boat operators</li> </ul>	<ul style="list-style-type: none"> <li>- Permission to take boats over corals</li> <li>- Impact of boats on corals</li> <li>- Effective code of conduct for operators</li> <li>- Financial viability</li> </ul>	4
2	Day trips to Nallathanni, Musal (Hare) and / or other islands.	*	C	<ul style="list-style-type: none"> <li>- Interested tourists</li> <li>- Forest Department</li> <li>- Fishing communities nearby</li> <li>- Entrepreneurs to operate shops and refreshment facilities for visitors</li> <li>- Coast guard</li> <li>- Boat operators</li> </ul>	<ul style="list-style-type: none"> <li>- Buses for taking tourists down coast</li> <li>- Boats for tourists</li> <li>- Safety equipment</li> <li>- Training to local people in nature guiding and English language and / or Hindi</li> </ul>	<ul style="list-style-type: none"> <li>- Permission</li> <li>- Improvements of roads down coast</li> </ul>	3
3	Luxury neighbourhood friendly 'eco-resort' hotel	**	B	<ul style="list-style-type: none"> <li>- Interested 'better-off' tourists</li> <li>- Hotel company with ethical policies</li> <li>- Local fishing community</li> <li>- Local artisans</li> <li>- Local guides and boat operators</li> </ul>	<ul style="list-style-type: none"> <li>- Finance</li> <li>- Expert advice (e.g. from Swamimalai resort)</li> <li>- Community support</li> </ul>	<ul style="list-style-type: none"> <li>- Fresh water availability for the hotel</li> <li>- Financial viability</li> </ul>	4

3	Pearl cultivation by tourists	**	B	<ul style="list-style-type: none"> <li>- CMFRI</li> <li>- Boat operators</li> <li>- Communities working in pearl cultivation with MSSRF</li> <li>- Interested tourists</li> </ul>	<ul style="list-style-type: none"> <li>- Pearl implants imported from Japan</li> <li>- Oysters from CMFRI</li> <li>- Nets and other equipment</li> <li>- Location to keep oysters</li> </ul>	<ul style="list-style-type: none"> <li>- Permission to rear pearls (e.g. near Krusadai island)</li> <li>- Success rate of pearl productions</li> </ul>	4
3	Turtle hatchery with tourist viewing facilities	*	A	<ul style="list-style-type: none"> <li>- CMFRI</li> <li>- Fisheries Department</li> <li>- Forest Department</li> <li>- Coast Guard</li> <li>- Interested tourists</li> <li>- Boat operators</li> </ul>	<ul style="list-style-type: none"> <li>- Funds</li> <li>- Technical expertise</li> </ul>	<ul style="list-style-type: none"> <li>- Successful rearing of turtles</li> <li>- Impact of tourist viewing on turtles that would be released into wild</li> </ul>	3
4	Village tourism in Sankumal	***	B	<ul style="list-style-type: none"> <li>- Forest Department</li> <li>- Sankumal village community</li> <li>- Foreign budget tourists</li> <li>- Police / Coast guard</li> </ul>	<ul style="list-style-type: none"> <li>- Improved sanitation</li> <li>- Improved water supply</li> <li>- Permission from police / forest department</li> </ul>	<ul style="list-style-type: none"> <li>- Permission</li> <li>- Lack of land papers</li> </ul>	3
5	Eco-beach resort on the road to Dhanushkodi	**	B	<ul style="list-style-type: none"> <li>- Interested tourists</li> <li>- Forest Department</li> <li>- Fishing communities nearby</li> <li>- Police</li> <li>- Vendors</li> <li>- Entrepreneurs to make huts, sun shelters, refreshment facilities etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Improved sanitation</li> <li>- Improved water supply</li> <li>- Permission from police / forest department</li> </ul>	<ul style="list-style-type: none"> <li>- Permission</li> <li>- Lack of land papers of those developing the place</li> </ul>	2
6	Eco-beach resort on mainland near Nallathanni Island	**	B	<ul style="list-style-type: none"> <li>- Interested tourists</li> <li>- Forest Department</li> <li>- Fishing communities nearby</li> <li>- Police / coast guard</li> <li>- Vendors</li> <li>- Entrepreneurs to make huts, sun shelters, refreshment facilities etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Improved sanitation</li> <li>- Improved water supply</li> <li>- Permission from police / forest department</li> </ul>	<ul style="list-style-type: none"> <li>- Improvements in road access necessary</li> <li>- Permission for development on government land</li> </ul>	2

iv) Eco-enterprises

<i>Rank</i>	<i>Product or enterprise</i>	<i>'Pro-poor' rating</i>	<i>Environmental impact rating</i>	<i>Key stakeholders to be involved</i>	<i>Most Important Inputs necessary</i>	<i>Key factors affecting success or failure</i>	<i>Feasibility index</i>
1	E-mail & internet facility for tourists to be associated with yoga / meditation ashram.	**	B	<ul style="list-style-type: none"> <li>- Trained computer user women from Ramakrishnapuram</li> <li>- Tourists staying at ashram</li> </ul>	<ul style="list-style-type: none"> <li>- Computers, modems, telephone connections</li> <li>- Initial outlay on internet connection etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Sufficient up-to-date computers</li> <li>- Sufficient use to make it economically viable</li> </ul>	5
1	Bicycle rental enterprise with bicycle workshop.	***	A	<ul style="list-style-type: none"> <li>- Tourists who need bicycles</li> <li>- Other bicycle riders who need maintenance facilities</li> <li>- Women entrepreneurs</li> </ul>	<ul style="list-style-type: none"> <li>- Several cycles</li> <li>- Basic tools and spare parts for maintaining bikes</li> <li>- Training in cycle maintenance</li> </ul>	<ul style="list-style-type: none"> <li>- Demand for cycles and maintenance</li> <li>- Interest amongst women entrepreneurs</li> <li>- Financial viability</li> </ul>	4
2	Small-scale low-cost solar fish driers	**	B	<ul style="list-style-type: none"> <li>- Solar drier producers</li> <li>- Traditional fishers</li> <li>- Mechanised fishers</li> <li>- Women who dry fish</li> <li>- SHGs / Federation of SHGs</li> </ul>	<ul style="list-style-type: none"> <li>- Capital to invest in driers</li> <li>- Fish in appropriate amounts</li> <li>- Labour</li> </ul>	<ul style="list-style-type: none"> <li>- Market for dried fish</li> <li>- Organisational capacity to manage driers cooperatively</li> <li>- Financial viability</li> </ul>	4
3	Palm basket making for replacement of plastic packaging	***	A*	<ul style="list-style-type: none"> <li>- Palmyra growers</li> <li>- Women entrepreneurs skilled in basket making</li> <li>- SHGs / Federation of SHGs</li> <li>- Consumers</li> <li>- Existing palm basket producing companies</li> </ul>	<ul style="list-style-type: none"> <li>- Palmyra leaves</li> <li>- Credit to start enterprise</li> </ul>	<ul style="list-style-type: none"> <li>- Effective marketing</li> <li>- Financial viability</li> </ul>	3
3	Tailoring of cotton bags to replace plastics with tailors trained by ashram tailoring training centre	***	A	<ul style="list-style-type: none"> <li>- Women entrepreneurs skilled in tailoring</li> <li>- SHGs / Federation of SHGs</li> <li>- Consumers</li> <li>- Cotton cloth traders</li> </ul>	<ul style="list-style-type: none"> <li>- Cotton cloth from outside the area</li> <li>- Printing equipment</li> <li>- Sewing machines</li> <li>- Credit to start enterprise</li> </ul>	<ul style="list-style-type: none"> <li>- Effective marketing</li> <li>- Financial viability</li> </ul>	3

<i>Rank</i>	<i>Product or enterprise</i>	<i>'Pro-poor' rating</i>	<i>Environmental impact rating</i>	<i>Key stakeholders to be involved</i>	<i>Most Important Inputs necessary</i>	<i>Key factors affecting success or failure</i>	<i>Feasibility index</i>
3	Marketing of non-plastic alternatives accompanied by area-wide ban on plastics	***	A*	<ul style="list-style-type: none"> <li>- Producers of alternatives to plastics</li> <li>- Market facilitator (e.g. Federation of SHGs, local NGO, specially formed fair trade organisation,</li> <li>- Buyers</li> </ul>	<ul style="list-style-type: none"> <li>- Advice in establishing fair trade practices</li> </ul>	<ul style="list-style-type: none"> <li>- Expertise of market facilitator in fair trade</li> <li>- Strength of monopolies held by existing exploitative producers</li> <li>- Ability of fairly traded produce to compete (economic viability)</li> </ul>	3
3	Production of bio-fertilisers from hotel / restaurant and temple organic wastes	**	A*	<ul style="list-style-type: none"> <li>- Restaurant / hotel / temple staff</li> <li>- Composting entrepreneurs</li> <li>- Buyers / users of biofertilisers</li> </ul>	<ul style="list-style-type: none"> <li>- Worms to start vermiculture or Effective Micro-organisms (if suggested)</li> <li>- Ongoing, regular supply of waste</li> </ul>	<ul style="list-style-type: none"> <li>- Market demand for the product</li> <li>- Ability to compete with other producers</li> <li>- Financial viability</li> </ul>	3
4	Women's cooperatives to make tourist trinkets and materials for worship in the temple	***	B	<ul style="list-style-type: none"> <li>- Skilled women</li> <li>- SHGs / Federation of SHGs</li> <li>- Buyers of handicrafts</li> <li>- Retailers</li> </ul>	<ul style="list-style-type: none"> <li>- Materials for making crafts</li> </ul>	<ul style="list-style-type: none"> <li>- Competition with existing monopoly holders</li> <li>- Making fair trade competitive</li> <li>- Financial viability</li> </ul>	3
4	Neem processing	***	A	<ul style="list-style-type: none"> <li>- Owners of neem trees</li> <li>- Buyers of herbs / neem products</li> <li>- Neem processing technicians</li> <li>- Women or men interested in neem processing work</li> </ul>	<ul style="list-style-type: none"> <li>- Neem</li> <li>- Appropriate processing technology</li> <li>- Packaging supplies for products</li> </ul>	<ul style="list-style-type: none"> <li>- Market viability</li> <li>- Cost of technology for processing</li> </ul>	3
4	Paper bag production (if possible using recycled materials)	**	A*	<ul style="list-style-type: none"> <li>- Entrepreneurs</li> <li>- Hand made paper technicians</li> <li>- Collectors of old newspapers</li> <li>- Consumers</li> <li>- SHGs / Federation of SHGs</li> </ul>	<ul style="list-style-type: none"> <li>- Old newspapers and magazines</li> <li>- Glue</li> <li>- Credit to start enterprise</li> </ul>	<ul style="list-style-type: none"> <li>- Effective marketing</li> <li>- Financial viability</li> </ul>	2

<i>Rank</i>	<i>Product or enterprise</i>	<i>'Pro-poor' rating</i>	<i>Environmental impact rating</i>	<i>Key stakeholders to be involved</i>	<i>Most Important Inputs necessary</i>	<i>Key factors affecting success or failure</i>	<i>Feasibility index</i>
4	Apiculture - with indigenous <i>Apis cerana indica</i>	***	A	<ul style="list-style-type: none"> <li>- Interested women or men</li> <li>- Techicians (e.g. from PHCC)</li> </ul>	<ul style="list-style-type: none"> <li>- Bee colonies</li> <li>- Appropriate technology</li> <li>- Ongoing training &amp; extension support</li> <li>- Sugar for bee feeding</li> </ul>	<ul style="list-style-type: none"> <li>- Bee diseases such as Thai Sac Brood Virus (TSBV)</li> <li>- Forage (flowers) availability / dearth</li> <li>- Availability of bees in the area</li> </ul>	2
5	Female guides and taxi / auto-rickshaw drivers for women travellers.	**	B	<ul style="list-style-type: none"> <li>- Interested women</li> <li>- Swami Pranavananda</li> <li>- Taxi / auto- drivers associations</li> <li>- Associations of guides</li> </ul>	<ul style="list-style-type: none"> <li>- Access to use of Vehicles</li> <li>- Training in driving</li> <li>- Driving licenses</li> <li>- Training in guiding</li> <li>- Language training</li> </ul>	<ul style="list-style-type: none"> <li>- Availability of vehicles and training to women</li> <li>- Pressure from existing male drivers and guides</li> </ul>	2
6	Recycling enterprise, especially finding use for plastic bottles	*	A*	<ul style="list-style-type: none"> <li>- Entrepreneurs</li> <li>- Municipal authorities in charge of waste disposal</li> </ul>	<ul style="list-style-type: none"> <li>- Appropriate technology for recycling</li> </ul>	<ul style="list-style-type: none"> <li>- Availability of technology</li> <li>- Financial viability</li> </ul>	0 as yet

## 11 Conclusions

The Gulf of Mannar and its Marine Biosphere Reserve is an area of outstanding beauty and fascinating biodiversity that is currently under enormous pressure from over-exploitation of fishery resources. The fishing people who live along the coast associated with the reserve depend solely upon marine resources for their livelihoods. Since supply of fresh water is severely limited and the soils are mainly sand that is unsuitable for most kinds of agriculture, options for diversification of fishing community livelihoods are severely limited. This means that alternative less extractive exploitation of marine resources needs to be developed through development of sustainable ecotourism.

Three types of tourism have been identified as suitable for development in the Gulf of Mannar region, namely: educational tourism, religious tourism and nature or leisure tourism. In brief the types of product are summarised as:

*Educational tourism:* CD Rom / Website, Interpretive centre, Field study centre on Krusadai island, oceanarium (aquarium for showing marine life), student conservation volunteer holidays, improvements in CMFRI's aquarium and museum, snorkelling and diving school.

*Religious tourism:* package tour of religious site, Yoga ashram development with village tourism, pilgrimage to Muniya Swami shrine on Nallathanni island, renovation of temples and tanks.

*Nature / Leisure tourism:* boat trips for snorkelling, diving or viewing through glass-bottomed boat; ecobeach resorts for village tourism (e.g. in Sankhumal, on the road to Dhanushkodi and near Nallathanni island); fish barbecues on beach; turtle watching at turtle hatchery; pearl cultivation by tourists; luxury eco-resort on fishing village theme.

In addition a number of eco-enterprise options have been suggested in the following categories:

*Tourist service related businesses:* e-mail and internet facility; bicycle hire and maintenance; female guiding and taxi service for lone women travellers;

*Fair trade / cooperative production for fisher women:* dried fish, shell handicrafts and temple offerings; palm baskets, cotton bags, biofertilisers; recycled newspaper bags;

*Alternative enterprises:* apiculture (beekeeping and beeswax enterprise), neem processing.

This report focuses on a detailed list of the ecotourism products and ecoenterprises, provides a SWOT analysis for each and an overview of the steps that need to be taken to overcome the barriers to their development. On the basis of feasibility, impact upon the poor and impact upon the environment the enterprises have then been ranked in order of priority.

The prioritised ecotourism and eco-enterprise options can be undertaken as an integrated part of developing a multi-stakeholder plan for sustainable community-based marine resource management. It will be necessary to address the policy and planning framework first through capacity building of government and non-governmental organisations at all levels, then stakeholder analysis with conflict resolution will be essential to generating inter- and intra- stakeholder group consensus on management issues. Alongside this, infrastructural barriers will need to be overcome and awareness raising aspects tackled. Finally through skill development and further capacity enhancement of CBOs enterprise development can get started. However it is important to make participatory business plans and market analysis of the options and to conduct research into the carrying capacity of different areas in the reserve to verify that the products and enterprises are not environmentally damaging and have a firm economic basis.

## 12 Recommendations

On the basis of information gathered in the Gulf of Mannar during a one-week visit and secondary data sources, the following recommendations for improving the management of the area and integrating ecotourism and eco-enterprise into a sustainable management plan for the Marine Biosphere Reserve can be drawn.

- i) The multi-stakeholder committee for '*Strengthening the management of the Gulf of Mannar Marine Biosphere Reserve*' should be reactivated. Once active and able to reach consensus the committee should be endowed by the government with decision-making authority about the management of the area.
- ii) In order for marine resource management to be improved, and for ecotourism, eco-enterprise and any other diversification of livelihood strategy for the poor fishing communities who depend upon marine resources of the area to be developed, **barriers to development need to be addressed**. The barriers and actions to remove them are summarized as follows:

### *Building a supportive policy environment*

The committee (mentioned above) should be reactivated, supported to build its capacity and then given managerial responsibilities.

**Government departments of Forests, Fisheries, Coast Guard and Tourism should coordinate and collaborate towards the common aim of protecting biodiversity** of the marine resources in the biosphere reserve whilst **enabling sustainable exploitation of the area to maintain the livelihoods of the poor** who live along the coast.

Specifically this would involve:

**a) Replacement of current restrictions** on access to the islands and waters with regulations enabling fixed quotas of tourists, students and scientists **to allow access to clearly defined areas for clearly stipulated activities by different types of visitor** (e.g. scientists and students on Krusadai island, religious pilgrims on Nallathanni Island, restricted numbers of nature walkers, snorkellers, glass-bottomed boat trippers to Musal and Nallathanni islands and their coral reefs, general boating and snorkelling tourists to Sankumal coral reef).

**b) Relaxation of rules concerning need for land documents to develop tourist huts on the beach.**

Some kind of provision should replace the current rules, allowing special dispensation for *local* residents to erect limited numbers of huts with associated (obligatory) compost toilets, sunshades and informal restaurants, using only locally available renewable resources such as coconut thatching.

### *Infrastructure development*

In order to facilitate development of ecotourism products and also market possibilities for eco-entrepreneurs, the following infrastructural improvements are called for:

- Improvement of the **roads** down the east coast between Mandapam and Thuthukodi (Tuticorin)
- Construction of **sewage processing plants** for Rameshwaram and for Mandapam, including the third stage of 'nutrient stripping' of the waste to avoid eutrophication of the sea with phosphates and nitrates.
- Construction of **septic tanks with low seepage rates** into the aquifers for toilets in tourist facilities with smaller numbers of visitors.
- Improvement and expansion of **drinking water supplies** for coastal communities.
- Improvement of solid **waste disposal facilities**, especially in the Rameshwaram area
- Effective implementation of the **ban on plastics** for Tamil Nadu.
- Improvement of **drainage systems**, especially in Rameshwaram.
- Promotion of **shallow, compost toilets (one for every household)** for communities along the coast and eco-beach resorts and planting of coconut trees on the site once full.
- **Improvement of desalinisation processes** such that the water is less damaging to human health.

### Awareness-raising

In order to generate a demand for eco-tourism and also to help communities to realise the importance of the biodiversity in the Marine Biosphere Reserve a **broad-reaching awareness raising programme** is necessary with the following components:

#### **Biodiversity conservation awareness**

- Creation of an educational **CD Rom / Website** on the Gulf of Mannar its biodiversity, history and cultural significance (see educational tourism product list below);
- Creation of **posters, pamphlets and videos in Tamil, English and Hindi** about the Gulf of Mannar and its biodiversity;
- Introduction of a **biodiversity conservation awareness programme** in schools with competitions for posters, pamphlets and street dramas, environmental clean-up action groups and activities;
- Construction of an **interpretive centre** on the Gulf of Mannar in Rameshwaram near current tourist centre (see educational tourism product list below);
- **Modernisation of the CMFRI aquarium and museum** to educate school and university students about the Marine Biosphere Reserve.

#### **Tourism awareness**

- Local fisherpeople of the Gulf of Mannar lack awareness about tourism especially foreign tourists (i.e. what kind of attractions tourists like, what behaviour they feel comfortable with, what they like to buy, and so on). In order for village tourism to be possible and for local people who know about marine biodiversity to share their knowledge with tourists **training about tourism** should be provided for fishing communities.

### Conflict resolution

As marine biodiversity is becoming destroyed through unsustainable exploitation of resources conflicts between stakeholders increase. This is especially the case between the mechanised boat owners who conduct environmentally damaging trawler fishing and the traditional or country boat fishers who fish using traditional, less intensive techniques. Conflict also occurs between different government departments over control of the resources.

Special efforts to **resolve conflicts** by working with different stakeholder groups separately and then bringing them together is urgently called for. This is a **pre-requisite to the effective functioning of the multi-stakeholder committee** for Strengthening the Management of the Marine Biosphere Reserve and for bringing about a sustainable community-based fisheries management plan.

### Skill development

The poor who need to diversify their livelihoods away from extractive fishing lack skills to do so. Various areas of skills development need to be offered to fishing community members such as:

- Tourist guiding;
- English and Hindi Languages;
- Nature guiding with specialist areas including bird identification, plant identification, marine life identification;
- Snorkelling and SCUBA diving with attention to coral conservation and safety of divers / swimmers;
- Life-saving;
- Hygienic food preparation / European cooking;
- Basic primary health and sanitation;
- Low-cost compost toilet building;
- Hotel and lodge management;
- Computer skills;
- Basket making;
- Shell handicraft making;
- Composting of kitchen wastes (including vermiculture and Effective Micro-organisms);

- Neem processing;
- Beekeeping;
- Improved fish drying / use of solar driers;
- Pearl cultivation;
- Bicycle maintenance;
- Tailoring;
- Paper making;
- Taxi and auto-rickshaw driving and boat operation.

### Capacity building

There are a number of different organisations involving or impacting upon the poor, which have the potential to support them in diversifying their livelihoods. These organisations and their for need capacity strengthening are listed below:

- Panchayat, District and State level government need training in:
  - o Participatory planning;
  - o Conflict management;
  - o Sustainable resource management;
  - o Gender issues.
- Women's Self Help Groups (SHGs), Federation of SHGs, Fisher Women's Cooperative Societies and Fishermen's Cooperative Societies, other Community Based Organisations (CBOs), together with the NGOs that serve them need strengthening in:
  - o Cooperative formation and management;
  - o Fair trade market facilitation;
  - o Advocacy (re. land rights, women's rights, etc).

iii) Conduct further research building on the ideas and suggestions on this report on the following topics:

- **Market analysis** of each of the various ecotourism products and eco-enterprises suggested (listed below) with emphasis on possibilities to restrict or prevent middlemen from preventing profits reaching the poor.
- Preparation of **comprehensive and participatory business plans** for each individual ecotourism product or eco-enterprise (listed below).
- **Carrying capacity assessment** of the Gulf of Mannar in terms of development of tourism and of enterprises listed below and others such as agar production, seaweed cultivation, pearl oyster cultivation, aquaculture of economically valuable species and so on.
- **Detailed stakeholder analysis** leading to managing of stakeholder conflict and developing community based sustainable fisheries management plans for clearly defined areas.

Each of the above studies should make special reference to the following possible ecotourism products and eco-enterprises identified in this study. Note that products and enterprises are ranked within the 4 categories in order of current feasibility and appropriateness:

#### Category 1: **Educational tourism products**

- Production of an interactive CD Rom / Website on Gulf of Mannar,
- Interpretive centre on the Gulf of Mannar and it's biodiversity (close to the existing tourist centre)
- Field study centre in Krusadai Island for scientists and university students.
- Student conservation volunteer holidays
- Oceanarium (i.e. large aquarium) with examples of marine wildlife
- Modernisation and upgrading of the museum and aquarium of the CMFRI for school groups and students
- Snorkelling and scuba diving school for ecologically positive ways of viewing marine wildlife

#### Category 2: **Religious tourism products**

- Package tour of religious sites

- Yoga / meditation ashram in Swami Pranavananda's fishing community
- Pilgrimage tours to Muniya Swami temple on Nallathanni Island
- Renovation of lesser known temples and tanks

#### Category 3: **Ecotourism products**

- Fish barbecues around fires on the beach in fishing villages for tourists, perhaps with cultural entertainment such as folk song or dance around the fire.
- Snorkelling boat trips to coral near Sankumal village (on the Palk bay side of Rameshwaram)
- Glass-bottomed boat trips to coral areas.
- Day trips to Nallathanni and / or other islands (e.g. Musal or 'Hare' Island) from Rameshwaram or Mandapam with associated snorkelling, bird-watching or other nature observation activities
- Development of an 'eco-resort' hotel with fair trade and neighbourhood friendly policies
- Pearl culturing by tourists
- Turtle hatchery with tourist viewing facilities
- Village tourism in Sankumal for model eco-beach in Rameshwaram locality
- Development of eco-beach resort on the road towards Dhanushkodi with accompanying optional extra activities of bird-watching, boat trips, nature walks, etc.
- Eco-beach resort on mainland near Nallathanni Island (as above)

#### Category 4: **Eco-enterprises**

- E-mail & internet facility for tourists to be associated with yoga / meditation ashram.
- Bicycle rental enterprise with bicycle workshop to be associated with yoga / meditation ashram and Sankumal village.
- Small-scale low-cost solar fish driers for fisherwomen for better quality dried fish.
- Palm basket making for replacement of plastic packaging
- Tailoring of cotton bags to replace plastics with tailors trained by ashram tailoring training centre
- Marketing of non-plastic alternatives accompanied by area-wide ban on plastics
- Production of bio-fertilisers from hotel / restaurant and temple organic wastes
- Women's cooperatives to make tourist trinkets and materials for worship in the temple organised through the Federation of Self Help Groups to ensure better working conditions and fair trade marketing.
- Neem processing.
- Apiculture - with indigenous *Apis cerana indica*;
- Paper bag production (using recycled newspaper and magazines)
- Female guides and taxi / auto-rickshaw drivers for women travellers.

- iv) **Draw upon the experiences of the Bay of Bengal Programme in Maldives and Malaysia** through **consultative visits** of specialist from these areas and through **technical tours of stakeholders** from all levels to these areas.
- v) **Develop a Participatory Sustainable Community-based Marine Resource Management Plan** via the committee for strengthening the management of the marine biosphere reserve.
- vi) **Implement this plan using participatory feedback systems** from all stakeholders to maintain it.

### 13 References

- Ab. Rahim G. Y.** 2000. Management of marine protected areas and marine parks at the micro-level. pp. 84-91. In "Report of the regional symposium on marine protected areas and their management" held in Alor Setah, Kedah, Malaysia, 1-4 Nov 1999. BOBP/REP/86.
- Anand, R.M.; Dorairaj, K.; Parida, A.** (Eds.) 1998. Biodiversity of Gulf of Mannar Marine Biosphere Reserve. Proceedings of the Technical Workshop held in Chennai, India 10-11 Feb 1997. MSSRF Proceeding no. 24.
- Ashley Caroline; Goodwin Harold; Roe Dilys,** 2001. Pro-poor tourism strategies: Expanding opportunities for the poor. *Pro-poor tourism Briefing no. 1.* CRT, IIED, ODI, UK.
- Ashley Caroline; Roe Dilys; Goodwin Harold,** 2001. Pro-poor tourism strategies: making tourism work for the poor - A review of experience. *Pro-poor tourism Report no. 1.* CRT, IIED, ODI, UK.
- Bay of Bengal Programme.** 2000. Report of the regional symposium on marine protected areas and their management. Held in Alor Setar, Kedah, Malaysia. 1-4 Nov. 1999. BOBP/REP/86 Chennai, India.
- Brahman, Scott; Fundacion Accion Amazonia.** 2001. Practical strategies for pro-poor tourism: TROPIC Ecological adventures - Ecuador. *Working Paper no. 6 on Pro-poor tourism.* CRT, IIED, ODI, UK.
- Deshmukh, S.; Venkataramani, G.** 1995. Gulf of Mannar Marine Biosphere Reserve. In: "Protecting endangered National Parks" Rajiv Gandhi Institute for Contemporary Studies. Project no. 7. pp 99-167.
- Devaraj, M.** 1998. Conservation and Sustainable Management of the Marine Living Resources of the Gulf of Mannar Marine Biosphere Reserve. In: "Biodiversity of Gulf of Mannar Marine Biosphere Reserve." pp. 23-31. MSSRF Proceeding no. 24.
- Dorairaj, K.** 1998. Economic and ecological Diversity Of Marine Fish Resources. . In: "Biodiversity of Gulf of Mannar Marine Biosphere Reserve." pp. 129-140. MSSRF Proceeding no. 24.
- Easterton, D.C.V.** 1998. Impact of Marine Pollution on the Ecological Resources. In: "Biodiversity of Gulf of Mannar Marine Biosphere Reserve." pp. 56-66. MSSRF Proceeding no. 24.
- FAO - BOBP** 2001. What is the code of conduct for responsible fisheries?
- Firaag, Ismail.** 1997. Tourism and the environment: current issues for management. In: *Workshop on integrated reef resources management in the Maldives. Held in Male, Maldives 16-20 March 1996.* Bay of Bengal Programme BOBP/REP/76 Madras, India.
- Hiew, Kevin W.P.** 1998. Marine parks of Malaysia: a management tool for fisheries resources. *Bay of Bengal News Volume II, no. 12 pp. 6-9.* ISSN 0971-3077.
- James, D.B.** 1998. Ecological Significance of Echinoderms. In: "Biodiversity of Gulf of Mannar Marine Biosphere Reserve." pp. 118-126. MSSRF Proceeding no. 24.
- Kaliaperumal, N.** 1998. Seaweed resources and Biodiversity values. In: "Biodiversity of Gulf of Mannar Marine Biosphere Reserve." pp. 92-97. MSSRF Proceeding no. 24.
- Kelleher, G.** 1998. Strengthening the management of the Gulf of Mannar Biosphere Reserve: Coastal conservation. Expert report of Coastal Conservation Advisor to MSSRF.
- Lim, Li Ching.** 1998. Carrying capacity assessment of Pulau Payar Marine Park, Malaysia. *Bay of Bengal Programme BOBP/REP/79* Madras, India.
- Madhu, S.R.** 1987. "We are hungry only for seaweed" Bay of Bengal News. No. 28. pp. 1-7.
- MSSRF** 1998. Gulf of Mannar Marine Biosphere Reserve Programme. In: "Biodiversity of Gulf of Mannar Marine Biosphere Reserve." pp. 1- 22. MSSRF Proceeding no. 24.
- MSSRF** 1999. Gulf of Mannar: Project for promotion of alternative livelihood options for the poor in the vicinity of the biosphere reserve. Project document submitted to Ministry of Rural Development, Govt. of India and UNDP.
- Nichol, J.** 1998.a. Gulf of Mannar Ecotourism Planning Framework. *South Asia Development Planning Inc.* 64 pp.
- Nichol, J.** 1998.b. Ecotourism and economic sustainability: a case study for community based ecotourism planning. In: "Biodiversity of Gulf of Mannar Marine Biosphere Reserve." pp. 174-178. MSSRF Proceeding no. 24.

- Nickerson, D.J., Maniku, M.H.** (Eds.) 1997. Workshop on integrated reef resources management in the Maldives. Held in Male, Maldives 16-20 March 1996. *Bay of Bengal Programme BOBP/REP/76* Madras India.
- Ramanujam, N. and Mukesh, M.V.** 1998. Deterioration of Coral Islands of Tuticorin Group: Human Impacts. In: "Biodiversity of Gulf of Mannar Marine Biosphere Reserve." pp. 69-73. MSSRF Proceeding no. 24.
- Renard, Y.; Darcheville, A; Krishnarayan, V.** 2001. Practical strategies for pro-poor tourism: A case study of St. Lucia Heritage Tourism Programme. *Working Paper no. 7 on Pro-poor tourism*. CRT, IIED, ODI, UK.
- Salim, K.H.** 1998. Community-based fishery management: an alternative approach in Malaysia. *Bay of Bengal News Volume II, no. 12 pp. 10-14.* ISSN 0971-3077.
- Saville, Naomi M.** 2001. Practical strategies for pro-poor tourism: case study of pro-poor tourism and SNV in Humla district, West Nepal. *Working Paper no. 3 on Pro-poor tourism*. CRT, IIED, ODI, UK.
- Saville, Naomi M.** 2002. Reaching the unreached in mountain tourism in West Nepal. In *Proceedings of the 10th dialogue of the MSSRF held in Chennai 28 - 31 Jan 2002*.
- Sen, Sevaly.** 1998. Building legitimacy for smart partnerships in fisheries management. *Bay of Bengal News Volume II, no. 12 pp. 15-19.* ISSN 0971-3077.
- Sze, Lee Wah; Chong, George; bin Abdullah, Mohd Pauzi.** 2000. An acoustic approach to resource mapping of Pulau Payar's coral reef. *A survey report for the Bay of Bengal Programme BOBP/REP/87* Chennai, India.
- TATA and SSFRD.** 1998. *Gulf of Mannar Marine Biosphere Socio Economic Sample Survey*. Tata Economic Consultancy Services and Society for Social Forestry Research and Development Tamil Nadu.
- Waheed, Ali.** 1998. Economic value of 'marine ecotourism' in the Maldives. *Bay of Bengal News Volume II, no. 12 p. 23.* ISSN 0971-3077.
- Yadava, Y.S.** 2001.a. Forging unity to manage fisheries. *Bay of Bengal News Volume III, no. 4. pp. 2-4.* ISSN 0971-3077.
- Yadava, Y.S.** 2001.b. The state of world fisheries and aquaculture. *Bay of Bengal News Volume III, no. 4. pp. 12-17.* ISSN 0971-3077.
- Yadava, Y.S.** 2001.c Fisheries profile of the Bay of Bengal: a fact sheet on India. *Bay of Bengal News Volume III, no. 4. pp. 25-27.* ISSN 0971-3077.
- Swami Pranavanada.** A report and appeal. Swami Vivekananda Kudil Charitable Trust, Rameshwaram.