



Sustainable Financing and Benefit-Sharing Strategy for Conservation and Management of Puttalam Lagoon

For the Project: Ecologically and Socio Economically Sound Coastal Ecosystem Rehabilitation and Conservation in Tsunami Affected Countries of the Indian Ocean – Sri Lanka Component

Thushara Ranasinghe

March 2010



ECOSYSTEMS AND LIVELIHOODS GROUP ASIA, IUCN





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List of Acronyms

AD	Assistant director
ADB	Asian Development Bank
AUSAID	Australian Government's Overseas Aid Programme
BMZ	Federal Ministry for Economic Corporation and Development
CBOs	Community Based Organizations
CCD	Coast Conservation Department
CEA	Central Environmental Authority
CEJ	Centre for Environmental Justice
CES	Compensations for Ecosystem Services
CFL	Compact Fluorescent Lamp
CIDA	Canadian International Development Agency
CSR	Community Social Responsibility
CZMP	Coastal Zone Management Plan
DANIDA	Danish International Development Agency
DDSP	District Disability Action Plan
DFID	Department for International Development (UK)
DOF	Department of Forest
DSD	Divisional Secretariat Division
DWLC	Department of Wildlife Conservation
EFL	Environmental Foundation Limited
EU	European Union
FAO	Food and Agriculture Organization
FI	Fisheries Inspectors
FMA	Fisheries Management Authority
GEF	Global Environmental Facility
GIS	Geographic Information System
GSMB	Geological Survey and Mines Bureau
HICZMP	Hambantota Integrated Coastal Zone Management Project
IDP	Internally Displaced People
IDRC	International Development Research Centre
ISB	Industrial Service Bureau
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
LMA	Lagoon Management Authority
SLLRDC	Sri Lanka Land Reclamation and Development Corporation
MBI	Market Based Instruments
MDG	Millennium Development Goals
MENR	Ministry of Environment and Natural Resources
MF&AR	Ministry of Fisheries and Aquatic Resources
MFF	Mangroves for Future
MPPA	Marine Pollution Prevention Authority
MTRB	Motorized traditional boats
NAQDA	National Aquaculture Development Authority
NARA	National Aquatic Resources Development and Research Agency
NBSB	Beach seine boats
NGOs	Non Government Organizations

NORAD	Norwegian Agency for Development Cooperation
NPA	National Plan of Action
NTRB	Non motorized traditional boats
NWPC	North Western Provincial Council
OFRP	Out board FRP boat
PEA	Provincial Environment Authority
PES	Payment for Environmental Services
PILF	Public Interest Law Foundation
PLCMP	Puttalam Lagoon Conservation Management Plan
PMOF	Provincial Ministry of Fisheries
RETA	Regional Technical Assistance
Rs	Sri Lankan Rupee (US\$1=Rs114)
SAM	Sustainable Area management
SDC	Swiss Development Cooperation
UDA	Urban Development Authority
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
WDA	Wayamba Development Authority

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Executive Summary

The Sri Lanka component of the *Ecologically and Socio-economically Sound Coastal Ecosystem Rehabilitation and Conservation in Tsunami Affected Countries of the Indian Ocean* project aimed at facilitating coastal ecosystem rehabilitation and conservation activities at Puttalam Lagoon. The communities living in these areas are extensively dependent on the resources provided by the surrounding coastal, lagoon and terrestrial ecosystems for their livelihoods and other economic activities. To achieve the objectives of this project, a set of activities were designed, planned and implemented. The project activities set the stage for strengthening the management of restored ecosystems which would help to offset future threats and pressures. The decrease in government financing and international donor funding for natural resource management has prompted the need to develop additional sustainable financing mechanisms for the long term conservation management of natural resources. Therefore, under this project a sustainable financing and benefit sharing strategy has been developed to describe the mechanism of ensuring continuous funding for implementation of the Puttalam Lagoon Conservation Management Plan (PLCMP) after the project period ends. The main purpose of the PLCMP is to address some of the threats faced by lagoon ecosystems and issues regarding their sustainable management of lagoon ecosystems.

In implementing the sustainable financing strategy the involvement of all the stakeholders who benefit from the ecosystem services of the lagoon and terrestrial ecosystems is essential. The management plan activities, particularly the ones involving benefit sharing would address the inequitable distribution of lagoon ecosystem services. The implementation of the sustainable financing and benefit sharing strategy would provide economic incentives, increase the cost effectiveness of lagoon management, support compatible enterprise development to provide alternative income to local communities and generate incentives and resources for conservation of the lagoon.

Sustainable financing and benefit sharing link management actions for ecosystem services to outcomes in terms of delivery for ecosystem services. If a sustainable financing and benefit-sharing mechanism is properly instituted and allowed to allocate funding for prioritized activities and to equitable economic, social and environmental benefit-sharing; lagoon management stakeholders and the surrounding communities would be able to generate enough revenue to finance a number of long term local sustainable development initiatives.

The project planned to make concrete investments in ecosystem rehabilitation measures, to rehabilitate and thereby restore the biodiversity of specific ecosystems and to enhance the provisioning of ecosystem services which would ensure the well-being of the communities who depend on the lagoon resources. In order to implement some of the proposed conservation management activities in the broad conservation management plan four pilot sites were identified and some activities were implemented in the selected sites as pilot activities.

The level of financing needed to transition from unsustainable to sustainable practices through implementing the sustainable management plan should first be understood. Out of all the activities that were supported by the project, there is first a need to set realistic short, medium and long term investment priorities based on community preferences, government priorities and donor interest. The short term objective is to raise adequate finances to establish the Lagoon Management Authority (LMA) and to continue some of the existing project initiatives. The medium term and long term objective is to provide strategies to raise funds from local, national and international sources to implement the Puttalam Lagoon Conservation Management Plan (PLCMP) which was developed under this project.

Since the legal provisioning necessary to establish the LMA under the Act is limited, a Fisheries Management Authority (FMA) can be established in the short term to achieve sustainable fisheries management in Puttalam lagoon. The institutional setup required to implement the Lagoon Conservation Management Plan and the sustainable financing mechanism including the operations of the Lagoon Management Fund needs to be identified. This fund will be called the Puttalam Lagoon Conservation Trust Fund (PLCTF). According to the PLCMP the fund should be spent on activities which support natural resources conservation management; up scaling the quality of conservation activities and the conservation movement in the management area; alternative livelihoods, basic facilities and infrastructure development for the lagoon fisher folk communities; strengthening community based enterprises, building the capacity of the fisheries communities, education and awareness raising programmes on sustainable resource use and conservation; and empowerment of community organizations and strengthening of NGOs and CBOs in the management area.

A redistributive and benefit sharing system must be put in place to ensure that pro-poor conservation in the project areas is funded and to address poverty and unsustainable resource use, equity issues and behavioral changes of the resource dependent communities. A prerequisite to establishing a benefit sharing mechanism is identification of the needs and niches for benefits sharing and institutional arrangements to share the actual benefits among the stakeholders. In order to implement a benefits sharing mechanism, there is a need to identify a). What benefits are generated locally, nationally and internationally from the lagoon ecosystems; b) What are the institutional arrangements to share the benefits among the stakeholders.

At present there are a number organizations working in the area including government agencies, NGOs and the private sector; and who have committed to invest financial resources for the lagoon resources management activities. There is vast potential to increase the self generated financial resources from the economic and livelihood activities which are in being implemented at the lagoon and surrounding ecosystem. The Fisheries Corporative Societies (FCS) can be played a major role in resource management and in generating financial resources and sharing the benefits generated from the project activities as well as natural resources. Building the capacity of the FCS on fund raising and management, needs and opportunities of benefit sharing and undertaking conservation management activities is a must. In long run the LMA can undertake sustainable financing as well as implementation of conservation and management activities with the support of FCS. The financing options described in this strategy may be able to generate a substantial amount of funding for the lagoon resources conservation and management.

1. Introduction

This report presents the sustainable financing and benefits sharing strategy under the existing legal mechanisms for long-term financing of biodiversity conservation and sustainable use of natural resources in Puttalam Lagoon. The strategy is one of the outcomes of the project, *Ecologically and Socio-economically sound Coastal Ecosystem Rehabilitation and Conservation in Tsunami Affected Countries of the Indian Ocean Sri Lanka* component.

The decrease in government financing and international donor funding for natural resource management has prompted the need to develop additional sustainable financing mechanisms for the long term conservation management of natural resources. Under this project a sustainable financing and benefit sharing strategy has been developed to ensure continuous funding for implementation of the Puttalam Lagoon Conservation Management Plan after the project period ends. The sustainable financing mechanism is defined as a diverse and stable portfolio that contributes to the smooth implementation of the conservation management plan by providing financial support for the implementation of conservation management activities which will ultimately result in the conservation of Puttalam lagoon and the sustainable utilization of its natural resources. Currently due to the lack of continuous funding for conservation projects the expected goals cannot be achieved in long term.

A sustainable financing and benefit sharing strategy addresses the problem of the government's (particular line agencies) inability to cope with the lack of funds to conserve the lagoon and its natural resources while correcting the market failures of common property management. In implementing the sustainable financing strategy the involvement of all the stakeholders who benefit from the ecosystem services of the lagoon and terrestrial ecosystems is essential. The management plan activities, particularly the ones involving benefit sharing could address the inequitable distribution of lagoon ecosystem services. The implementation of the sustainable financing and benefit sharing strategy could provide economic incentives, increase the cost effectiveness of lagoon management, support compatible enterprise development to provide alternative income to local communities and generate incentives and resources for conservation of the lagoon. They could also generate essential income to cover monitoring and operating costs (Domeier 2002)¹.

Since natural resources are public goods in nature, they are non-excludable because all consumers can consume them and one person's consumption detracts from others' use, for example over fishing. The main problem is that property rights are not well defined, making them susceptible to the free-rider problem and as a result over use of resources is inevitable. The free-riding occurs when the conservation of ecosystems generates costs which are not covered by all the beneficiaries of the ecosystem services (Emerton 2003)². In this sense, both the cost and benefits are distributed in an unequal way. 'Benefit sharing' has been proposed as one approach to bypass the contentious issue of property rights (Halla Qaddumi 2008)³.

The project interventions aimed at conservation of the lagoon in Puttalam and many interventions were undertaken. This may lead to unequal distribution of cost and benefits among the stakeholders. Therefore, the problem of inequity in distribution of cost and benefits of natural ecosystem conservation and management needs to be addressed in order to achieve the expected goals. Benefit sharing is one of the feasible ways to couple with a sustainable financing strategy to address the issue of free-riding. The notion of 'benefit sharing' is understood to refer to the fact that the benefits provide from ecosystems to a wide range of potential users and costs generated as a result of conservation and management of the lagoon ecosystem need to be balanced. A central feature of benefit sharing is issue linkage or 'broadening the basket' of potential benefits (Halla Qaddumi 2008).

In practice the concept of sustainable financing is being applied to correct the problem of the lack of funding for the conservation and management of natural resources. The objective of sustainable financing is to create a more predictable cash flow which is diversified in income streams and thereby reduces reliance on a single source of finance (Viviana et al 2005)⁴. The objective of benefit sharing is to balance the distribution of cost and benefit of conservation and management among all the stakeholders. Under this project *Ecologically and Socio-economically sound Coastal Ecosystem Rehabilitation and Conservation in Tsunami Affected Countries of the Indian Ocean* efforts will be made to address the long-term financing shortfalls and unequal distribution of cost and benefits among the stakeholders by developing this Sustainable Financing and Benefits Sharing Strategy for the Puttalam district.

Sustainable financing and benefit sharing link management actions on ecosystem services to outcomes in terms of delivery for ecosystem services. Therefore, generation of information is needed to convince policy makers to introduce relevant policies which will facilitate the implementation of this strategy. Review of current financing sources in terms of the on-going availability of funds, the diversity of funding sources, and the transparency and accountability of the financial resource management is essential. In addition, the funding gap for the continuous implementation of the proposed conservation and management activities needs to be calculated. As a first step to realizing benefit sharing, the costs and benefits of the proposed interventions need to be articulated in an objective language that is intelligible to the stakeholders involved. Economic analysis needs to be done to quantify the costs and use and non use benefits and their distribution among the stakeholders (Emerton 1999). These steps will provide the necessary information to explore the niches for diversified funding sources and to identify the ways to share the benefits.

It is vital to mention that developing sustainable financing mechanisms does not depend only on pure economics. There need to be laws and institutions in place that have the capacity to effectively facilitate the functions of the financing mechanism. Understanding current laws and institutional setup in the project area is needed to decide on what kinds of legal and institutional amendments need to be made in order to implement the sustainable financing and benefit sharing mechanism. If a sustainable financing and benefit-sharing mechanism is properly instituted and allowed to allocate funding for prioritized activities and to equitable economic, social and environmental benefit-sharing; lagoon management stakeholders and the surrounding communities would be able to generate enough revenue to finance a number of local sustainable development initiatives.

This strategy explains the necessary steps, information, institutional setup and laws required to implement a successful strategy for Puttalam lagoon. It also provides information, guidelines and methods to implement the sustainable financing and benefit sharing strategy for Puttalam lagoon. More specifically:

1. Institutional analysis and recommendations for suitable institutional arrangements to host the sustainable financing and benefit sharing mechanism.
2. Review of available acts, laws, rules and regulations which are relevant in the management of coastal and lagoon resources and other ecosystems, providing recommendations for the smooth implementation of the sustainable financing and benefit sharing strategy.
3. Review of current financing sources for lagoon conservation management, their sustainability and potential to incorporate their investment in lagoon resource conservation and management to this proposed mechanism (how their investment will compensate for some of the planned investments under this project in long run).
4. Summary of planned investments and financing needs in long run.
5. Estimate of the financial requirement for future implementation after the project ends.
6. Institutional and legal mechanism for sustainable financing and benefit sharing systems.

7. Identification, evaluation and recommendations to select diversified financing opportunities and options to gather resources to facilitate the smooth implementation of the lagoon conservation management plan which was developed under this project.
8. Steps and methods to assess the cost and benefits from the lagoon ecosystems and their distribution among different stakeholders and ways to identify the needs and opportunities for benefit sharing.

The Project

The Sri Lanka component of the *Ecologically and Socio-economically Sound Coastal Ecosystem Rehabilitation and Conservation in Tsunami Affected Countries of the Indian Ocean* project aimed at facilitating coastal ecosystem rehabilitation and conservation activities at Puttalam Lagoon. The selected area consists of ecosystems, which are rich in biodiversity but due to natural causes and human influence, are severely threatened and degraded. The communities living in these areas are extensively dependent on the resources provided by the surrounding coastal, lagoon and terrestrial ecosystems for their livelihoods and other economic activities. This has resulted in the degradation of the surrounding ecosystems, increasing the frequency of natural disasters and the vulnerability of surrounding communities to the disasters. In turn, due to their frequent occurrence, natural disasters would cause further degradation.

The goal of the project was to invest in the rehabilitation and restoration of threatened ecosystems thereby improving the provisioning services of the ecosystems, thus enhancing the well-being of the people. To achieve the objectives of this project, a set of activities were designed and planned. The project aimed to foster better dialogue and communication between coastal stakeholders at the local and national levels, and to actively engage different sectors and groups in working together to design and undertake coastal ecosystem rehabilitation and conservation. The project activities set the stage for strengthening the management of restored ecosystems which would help to offset future threats and pressures^a.

2. Socio-economics and environmental profile of the project area

2.1. Socio-economics profile

There are three Divisional Secretariat Divisions (DSD) around the lagoon, namely Puttalam, Kalpitiya and Wanathavillu. According to the Census and Statistics Department, in 2006 the population was approximately 74,629; 85,850 and 17,279 in the three DS divisions respectively. Puttalam and Kalpitiya DS divisions are densely populated in comparison to the Wanathavillu DS division. The population density of Puttalam and Kalpitiya is 430.63/km² and 556.74/km² respectively while the density of Wanathavillu is only 24.16/km² (Census and Statistic 2006). Since the early 1990s the population in the Puttalam district has increased greatly as scores of internally displaced persons (IDPs) fleeing from the ethnic conflict in the North and East have found refuge in the district. According to the available information there are around 63,145 displaced families settled in Puttalam. Despite sharing the area for over 17 years, there still are tensions between the IDPs and the original inhabitants over sharing of the limited resources and competing for opportunities (DDSP 2008)⁶. Lack of employment along with child labour, child trafficking, poor participation of women in community development, marginalization of disabled people and a limited awareness of environmental and conservation issues are just some of the serious social issues facing the community due to this sudden influx of population in Puttalam (DDSP 2008).

Poverty

Poverty in Puttalam can be analyzed as problems of economic insufficiency, material and human deprivation, which include low achievements in education, health and supply of other basic services; vulnerability to shocks and exposure to risks; voicelessness and powerlessness.

According the Household and Income and Expenditure Survey carried out in 2006/07, 10.6% of the households in Puttalam can be classified as poor households which accounts to approximately 104,000 persons. The mean income of the poor was estimated at Rs 11,176⁷ per household per month. On average five family members share a household, therefore the mean income per person per day comes to less than one dollar per day. The official poverty line for 2008 is Rs.2,863 (minimum expenditure per person per month to fulfill basic needs) (Census & Statistics 2009). In the BMZ project area, it was reported that the number of households below the poverty line are 16,864 in Puttalam, 36,197 in Kalpitiya and 6,373 in Wanathuvillu (Census & Statistics 2002). The unemployment rate in the Puttalam district is 15.2%, of which 9.1% are male and 28.7% female⁸. Forty eight point eight percent of the population consumed less than the minimum level of dietary energy consumption in 2006/07(MDG indicators 2008). Percentage distribution of land ownership in Puttalam is 77.1% with 22.9% of households not owning any types of land– this is the highest percentage in Sri Lanka. The 2006/07 household income and expenditure survey report states that 62.8% of households in Puttalam district are indebt.

The statistics presented above help to understand the interrelationship between all the variables which keep the population in poverty. Unemployment and the lack of opportunities have resulted in low income which in turn leads to inadequate dietary energy intake. Likewise all the other components of the poverty equation are interlinked and impact each other. These statistics however only show the superficial aspect of poverty and in-depth analysis is needed to comprehend the entire cycle of poverty. It is important to highlight the fact that these conventional poverty measurements are not adequate to measure the poverty in a district like Puttalam. In order to get an accurate picture of the Poverty in Puttalam district, more variables such as non-market environmental goods and services as well as non-material dimensions of poverty need to be incorporated into the poverty measurement formulae.

Livelihoods

The majority of the population in the project area is heavily dependent on natural resource based livelihood activities such as fisheries and agriculture etc. Fishing is the most important economic activity in the area with around 40% of the people depending directly or indirectly on fishing for their livelihood. There are 88 fishing villages in the three DS divisions which accounts for 24,111 members of the population. Fishing is the main income generating activity of about 88.8% of fishermen around the lagoon⁹. According to the 2006/07 census of fishing boats, there are 109 multi-day boats, 2,142 OFRP boats, 107 MTRD boats, 1,176 NTRB boats and 101 NBSB boats in these three divisional secretariat divisions^b. The estimated annual fish production in 2008 was 6,372 MT and catch per day per fishermen was 2.55kg (IUCN 2009).

The second most important economic activity is agriculture in which 29.3%¹⁰ of the people are engaged. Coconut, paddy, cashew, vegetables, and fruits are the main crops cultivated around the Puttalam lagoon area. Data regarding the number of people who engaged in each sector, crop production, the value of the annual production and the trend over the past years is not available.

In 1990 shrimp farms recorded covered an area of 500ha, this number had increased to 3,500ha by 1995 (IUCN 2009). According to the National Aquaculture Development Authority (NAQDA) estimates in 2006, there are about 1,434 shrimp farms with a total extent of 4,539ha in the region, of which more than 90% are located around the Puttalam lagoon. At present, it has been estimated that approximately 75% of the farms are not in operation (Pathirana et al 2008). Out of the existing prawn farms in Puttalam lagoon area the majority are small-scale illegal farms, 60% of which are less than 2 acres. Deserted shrimp farms are a common sight in the area (ADB-RETA 2003). The current trend is the conversion of abandoned shrimp farms into saltpans, coconut cultivation areas and shrimp aquaculture sites. Nearly 15% of the population is engaged in industries and services such as cement industry, salt production, government service etc.

2.2. Land use profile

The terrestrial and wetland ecosystems in and around the lagoon consist of mangroves, monsoon forests, salt marshes, scrub lands, rivers, sea grass beds, coral reefs and converted ecosystems for home gardens, coconut, cashew, paddy and banana cultivations (ADB-RETA, 2003). Shrimp farms and saltpans around the lagoon also cover a significant part of the lagoon terrestrial area.

Coconut is the main cultivation in the project area as it requires very little maintenance and can be easily grown in a coastal environment. Different scales of coconut land can be found, including home gardens. According to the most recent estimates there are approximately 9,436.55ha of coconut cultivations within five kilometers distance towards the inland side within the project area covering 479.5km². Scrub lands, mangroves and abandoned shrimp farms have been converted into coconut cultivations during last few decades (IUCN 2009)¹¹.

Cashew is the other important cash crop cultivated in the area. There are 776.7ha of cashew plantations within the project area 479.5km² radius from the lagoon bank. Cashew plantations are dominant in Wanathavillu DS division and can be seen in Puttam DS division as well. Estimates show that in 2009, cashew lands covered 1,533.24ha within a five kilometer radius around the Puttalam lagoon (IUCN 2009).

Home gardens of different scales are quite common. Home gardens near the Puttalam city and Kalpitiya area are comparatively smaller than the home gardens found in Wanathavillu DS division, next to the

^a Further information about the project can be obtained from the project document: IUCN 2007: Project Proposal, "Ecologically and socio-economically sound coastal ecosystem rehabilitation and conservation in tsunami-affected countries of the Indian Ocean"

^b OFRP- Out board FRP boat, MTRB- Motorized traditional boats, NTRB -Non motorized traditional boats, NBSB- Beach seine boats

lagoon. Within a five kilometer radius (about 479.5km²) of the lagoon, there are 5195.79ha of home gardens. There are a number of crop varieties ranging from commercial, subsistence and herbal varieties grown in these home gardens. Different types of vegetables and fruits are grown and in Kalpitiya large scale commercial vegetable, fruits and tobacco cultivations can also be seen. The most prominent land use around the Puttalam lagoon is the shrimp farms. Mangroves, salt marshes and scrub forests have been converted into shrimp farms during the last three decades. According to recent estimates by IUCN there are 650.95ha of active shrimp farms and 1,167.13ha of abandoned ones (IUCN 2009). The table below shows the status of the shrimp farms in Puttalam in 2008.

Table 1: Shrimp farms in Puttalam

Farm type	Number of Farms
Less than 2 ha	1,099
Over 2 ha	335
Authorized	530
Unauthorized	904
Total	1,434

Source: Pathirana et al 2008

The BMZ project area is known for its salt industry as the climate in the area provides the necessary conditions required for salt production. At present there are a 1,363.07ha of salt pans. During the 1990s there was only one saltpan in Puttalam lagoon area close to the Puttalam town, but today there are a number of saltpans of different scales. Mangroves ecosystems and salt marshes have been converted into saltpans and recently some abandon shrimp farms also have converted into the saltpans. These saltpans are managed by the government, local government authorities, private companies and individuals.

The table and the map below presents the assessment results under the BMZ project in 2009.

Figure 1: Land use pattern in the project area

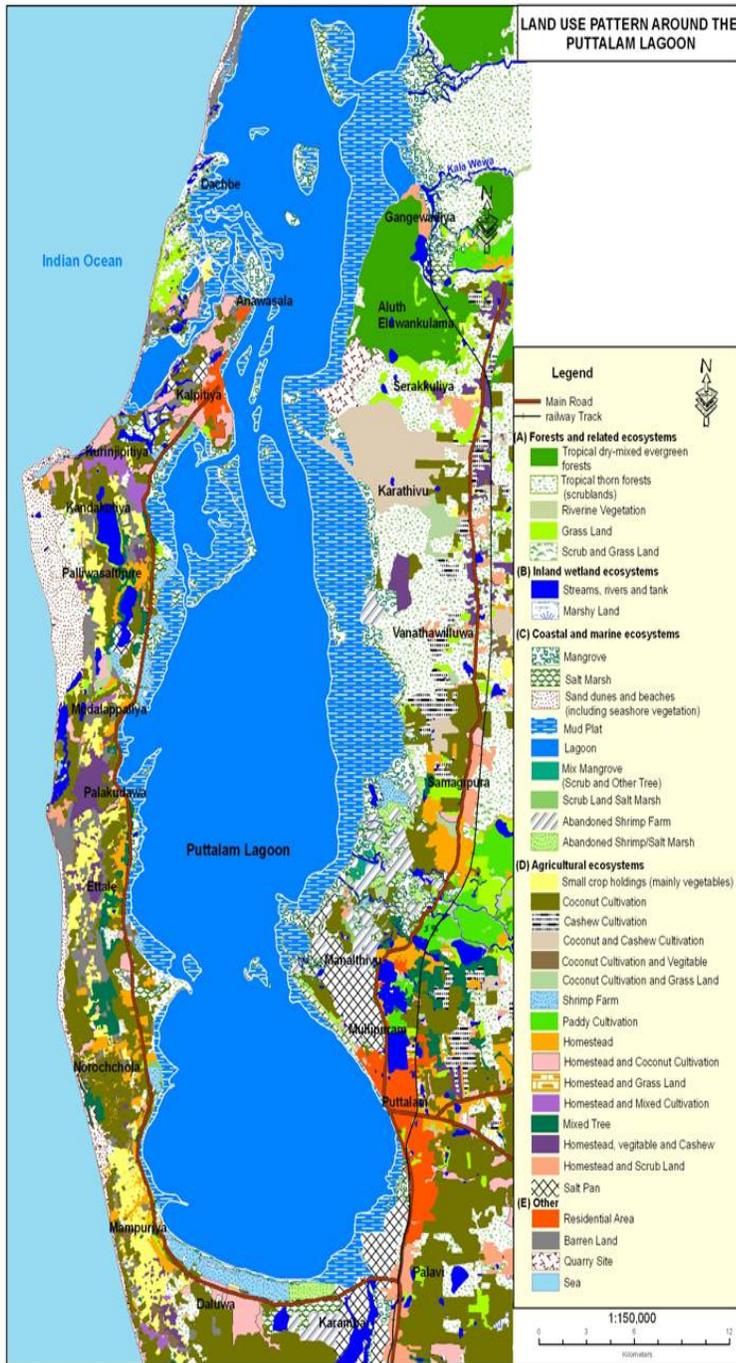


Table 2: Land use types and area

Land Use Type	Area in Hectares
Quarry Site	268.78
Abandoned Shrimp Farm	1,167.13
Barren Land	1413.1
Beach area	1,337.98
Beach Front Vegetation	191.45
Cashew Cultivation	776.7
Coconut Cultivation	9,436.55
Crop Land	1,533.24
Forest	8,000.33
Grass Land	1,360.05
Homestead	5,105.79
Mangrove	2,197.00
Marshy Land	50.84
Mixed Tree	959.79
Mud flats	8,169.86
Paddy Cultivation	770.39
Residential Area	940.88
Riverine Vegetation	172.63
Salt Marsh	701.98
Salt Pan	1,363.07
Scrub Land	7,785.61
Active Shrimp Farm	650.95
Villu	143.66
Surface water	1,588.57
Puttalm Lagoon	34,938.56

At present large scale infrastructure development projects which include road development, a coal power plant construction, tourism enhancement endeavors and private sector investments in salt production are being implemented and may results in further degradation of the lagoon and its surrounding environment.

2.3. Lagoon ecosystems and their importance

Puttalam lagoon is the second largest inland lagoon in Sri Lanka (CEA, 1999). It is located 070 55'- 180 20' North and 790 43'- 790 56' East in Puttalam District of the North Western Province - about 140km North of Colombo. The lagoon which extends over 46,000ha, consists of open water, mudflats, mangroves and marshes - the water surface area covers over 32,750ha (CEA, 1999). It is surrounded by a narrow ridge of land, sand dunes and long thin strip of sandy beaches towards the sea side (West Coast) and cultivated land and forests towards the land side (East and South of the lagoon). The length of the lagoon is approximately 35km, the width varies from 2.5km to 12km¹² and the depth is 1-2m¹³.

The Puttalam area comes under the dry and intermediate agro-ecological region with a mean annual rainfall of 1000-1500mm range in the southern region and a 700 to 1000mm range in the northern region. Due to high evaporation levels, the water in the North is of normal oceanic salinity while it is hypo-saline in the South (IUCN 2009). The lagoon opens to the sea at the northern end and is connected to the Dutch canal at the southern end. The river basins of Mee Oya, Kala Oya and Moongil Oya are connected and bring fresh water to the Puttalam lagoon. Salinity of the surface water varies between 0ppt at the river discharge point to 55.0ppt at the farthest point from the river discharge¹⁴. The surface temperature of the estuarine water varies from 28.5°C to 31.5°C¹⁵. The lagoon is rich with resources such as fish and shellfish species, sea grasses and mangroves etc. In addition, towards the northern side, next to the lagoon there is a marine sanctuary rich with diverse coral reefs. This region is one of the best tourism destinations in the country for dolphin and whales watching¹⁶.

Table 3: Protected areas around Puttalam Lagoon

<i>Beat</i>	<i>Village</i>	<i>Name of the protected area</i>
Attavilluwa	Tikali (Teli)	Welikandiya Conservation Forest
Attavilluwa	Tikali (Teli)	Nawalaoitikadu & Kalliyakadu Conservation Forest
Attavilluwa	Tikali (Teli)	Kalliyakuda Conservation Forest
Attavilluwa	Kalpitiya & Kuringipitti	Tattawelli Taravai Kany Conservation Forest
Attavilluwa	Tillaimotai	Thavalapittikadu Conservation Forest
Attavilluwa	Tillaimotai	Marikkarathora Conservation Forest
Attavilluwa	Tillaimotai	Thivu Conservation Forest
Attavilluwa	Tillaimotai	Tillamotaikani Conservation Forest
Attavilluwa	Karukkativu & Uslantivu	Karukkatiev Favave Kany & Yataravai Conservation Forest
Attavilluwa	Uslantivu	Yataravai Conservation Forest
Attavilluwa	Seguwanthivu	Nagativu & Seguwanthivu Kadu Conservation Forest
Attavilluwa	Seguwanthivu	Seguwanthivu Kadu, Uppukaravi & Kottaditivu Conservation Forest
Attavilluwa	Seguwanthivu	Seguwanthivu Kadu Conservation Forest
Attavilluwa	Seguwanthivu	Kurusadi Conservation Forest
Attavilluwa	Manativu	Kurusadi Conservation Forest
Vanatavillu	Kelutodaikadu & Karaitivu	Kelutodaikadu Conservation Forest
Vanatavillu	Kelutodaikadu & Karaitivu	Periyakudakadu Conservation Forest

Source: Department of Forest

Mangroves, sea grass beds along with other coastal and lagoon ecosystems in Puttalam provide vital services for the well-being of the surrounding communities. They support livelihoods, protect inland communities from extreme weather conditions, regulate the local climate and are of cultural and spiritual value to the inhabitants. In Sri Lanka - lagoons and other associated environments such as mangrove forests provide goods and services which play a major role in the local economy and domestic livelihoods of the surrounding communities. The revenue generated from the services provided by the lagoon and other associated ecosystems form an important part of rural income in Puttalam.

Lagoon and fisheries

The lagoon receives fresh water from two rivers, Kala Oya and Mee Oya, with an average discharge of roughly 2.2m³/s and 8.1m³/s respectively¹⁷. It is linked to the Mundal lagoon by a manmade canal called the Dutch Canal. The lagoon is divided into three parts; southern and the largest portion up to Kalpitiya is called the Puttalam lagoon, the middle portion from Kalpitiya to Uchcamunei is called the Dutch Bay and the northern portion, which opens into the sea, is called the Portugal Bay. Due to a wide-ranging area of sea grasses beds and the continuous flow of fresh water, the lagoon provides a habitat for a

wide variety of fish, shellfish and birds as well as for a number of threaten species such as Dugong (*Dugong dugong*) and sea horses (P. Dayaratne *et al* 1995; IWMI 2006)¹⁸.

Both finfish and shellfish species are harvested from the lagoon in large numbers throughout the year. Fishing is done using fishing crafts, operating drift gillnets, bottom-set nets, trammel nets, dragnets and encircling nets targeting mainly the finfish and crustacean resources¹⁹. In addition, various hand held gear such as push nets, pull nets and dragnet are used extensively and some traditional fishing methods such as Jaa-Kotu and Brush Piles are also used.

There are many finfish species in Puttalam lagoon. The most commercially valued estuarine fish are the Giant Perch- *Lates calcarifer* and Etroplus- *Etroplus suratensis*. In addition, Tarpon- *Megalops cyprinoides*, Milk fish- *Chanos chanos*, Lady fish- *Albula vulpes*, Half beaks- *Hemirhamphide*, Gar fish- *Belonidae*, Pony fish- *Leognathidae*, Silversides- *Athrerinidae*, Cat fish- *Siluridae* and Grey mullet- *Mugilidae* (*Mugil cephalus*) are some of the species that can be found in the lagoon. According to the available data, there are more than 100 edible species of brackish water fish and shellfish species (75% are fish, the balance is mostly crustaceans) in Puttalam lagoon, of which 65% are migrants from the sea, 30% are exclusively confined to the lagoon and five percent are migrants from fresh water sources²⁰. The shellfish include shrimps, crabs, gastropods and bivalves species.

There are approximately 2,500 fishermen using 2,200 crafts including mechanized and traditional boats, who directly depend on lagoon fisheries for their livelihoods as well as subsistence. Two types of fishermen have been identified - the first type only fish in the lagoon throughout the year while the second type mainly fish in the sea but during the off season (when the sea is rough) fish in the lagoon.

It was estimated that the maximum sustainable yield of the Puttalam lagoon fisheries is 5,536 MT (Dayaratne *et.al.*, 1995). During 1995 to 2005, it was reported that the fish catch has decreased from 4,800 MT to 3,800 MT (Pathirana *et. al.* 2008). Annual fish and shellfish catch from the Puttalam lagoon was estimated at 6,372 MT in 2008 (IUCN 2009).

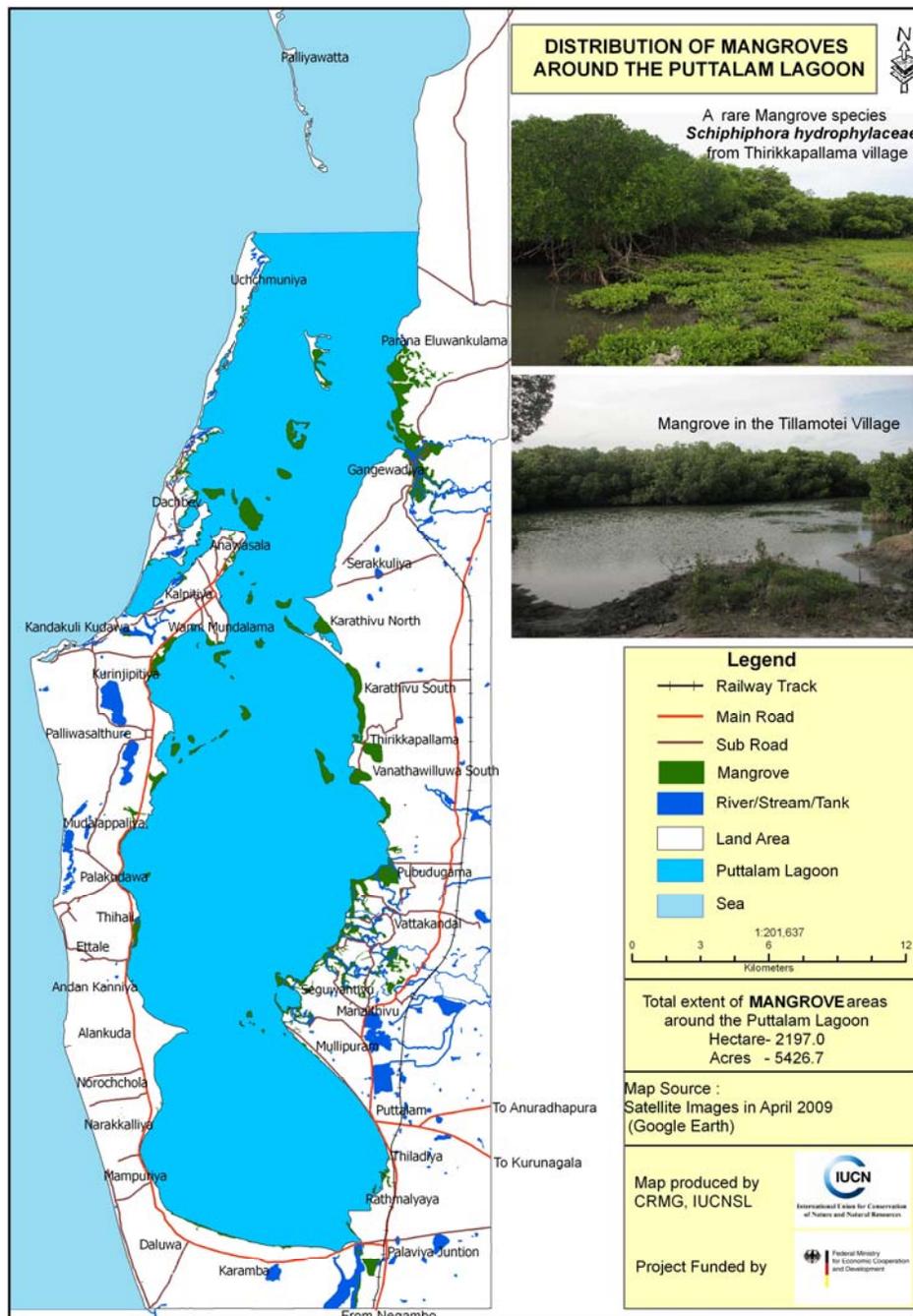
In addition to finfish, several invertebrates and sea horses which are used for ornamental and medical purposes are also collected for export (Dayaratne *et. al.*, 1995). Fish processing is also carried out by some households and dry fish is the most sought after type of processed fish in this area.

Mangroves

The Mangrove forest in the Puttalam lagoon area is one of the most valued mangrove forests in Sri Lanka, due to its diversity and distribution, although during the last few decades the expansion of shrimp farms, coconut cultivations and salt pans have resulted in the rapid decline of its species. The largest mangrove forest in Sri Lanka is located at the Kala Oya estuary²¹ which opens into the Puttalam lagoon. Similar to other mangrove habitats in the dry coastal zones, *Rhizophora mucronata* and *Avicennia marina* are the dominant species of Puttalam lagoon. *Avicinnia marina* is a common species in Puttalam lagoon and *Rizophora mucronata* dominates the waterfront areas of the riverine mangroves of Kala Oya. A total of 14 true mangrove plant species and 29 species of mangrove-associated species have been recorded in Puttalam lagoon and Dutch Bay (ADB – RETA, 2003). The Mangrove community is unique, because it harbors two rare mangrove plant species², namely *Scyphiphora hydrophyllacea*, Gaertn.f. (a true mangrove plant species) and *Cynometra iripa*, Kostel (a mangrove associate). According to IUCN national redlist these two species are listed under the critically endangered category²².

Mangroves are important for the health and biodiversity of the lagoon ecosystem as well as the well-being of the surrounding communities. Although the conversion of mangrove forests for alternative uses and other threats have reduced the mangrove cover, the surrounding communities still rely on them for

Figure 2: Mangroves in Puttalam lagoon



goods and services. Studies conducted in the area²³ have documented the uses of mangroves and estimated their economic value to the surrounding communities. It was estimated that the communities in the Wanathavillu division generate Rs.218,000/year (RS.30/household/week) from mangrove services, Rs 584,000/year from mangrove timber products, Rs.57,600/year from hunting in mangrove ecosystems and Rs.106million per year from fish production.

The lagoon and its resources were mapped out under this project and an updated version of the land use map was produced in 2009 by IUCN Sri Lanka. According to the latest ground truth assessment map, currently there are approximately 2,197ha of mangroves in and around the Puttalam lagoon (Figure 2).

Salt marshes

Salt marshes can be found within mangrove patches around the lagoon, increasing its scenic beauty. They are closely associated with mangrove ecosystems and often found as a mosaic. High saline soil in the area prevents other types of ecosystems from thriving and so only salt tolerant species can be found in these regions. Succulent halophytic plants such as *Sueda maritime*, *Sueda monoica*, *Sueda nudiflora* and *Salicornia brachiata* dominate the salt marshes. Certain salt marsh plants are edible and so farmers often graze their cattle in these areas. Expansion of salt terns and shrimp farms as well as refugee settlements are the main reasons for the degradation of salt marshes in Puttalam lagoon. In 1981 approximately 1,434.9ha of salt marshes in the Puttalam district was recorded – this number had reduced to 700.7 ha by 1992²⁴.

Sea grasses

Tropical sea grass communities are among the most productive ecosystems of the world²⁵. Puththalam lagoon harbors well grown sea grass ecosystems that support the fisheries industry. Sea grass beds in the lagoon are dominated by two sea grass species, namely *Cymodocea rotundata* and *Enhalus acoroides*. Other major species found in the lagoon are *Thalassia hemprichii*, *Halodule uninervis*, *Syringodium isoetifolium*, *Cymodocea serrulata*, *Halophila ovalis* and *Halophila decipiens*. These tropical sea grass beds provide substrate for many epiphytic species. Crustaceans and fish use them as feeding grounds, spawning grounds and nurseries²⁶. The Dugong (*Dugong dugong*), a threatened marine mammal, also feeds on sea grass.

Coral reefs

Four major coral reefs are found in Puttalam district - the Bar Reef Marine Sanctuary, Kandakuliya Reef, Talawila Reef and Mampuri Reef²⁷. Declared as the second marine protected area in Sri Lanka, the Bar Reef Sanctuary is located to the West of the Kalpitiya Peninsula, and runs parallel to the Puttalam lagoon. It extends over 306.7km² and is considered to be the largest marine sanctuary in Sri Lanka. The true coral reef covers about 70km² and comprises of well-grown coral. A total of 118 madreporarian species belonging to 50 coral genera was recorded in the sanctuary. However, *Acropora* is the most dominant coral genera in the Puttalam area. Three hundred species of reef associated fish have been recorded in the sanctuary²⁸. Due to this abundance this area has now become a well known tourism destinations for snorkeling, scuba diving, dolphin and whales watching, sea turtle watching and other tourism activities²⁹.

Mudflats

Inter-tidal mudflats are very common near the lagoon area. Some mudflats are around 800m wide while others are just a few metres in length. These mudflats provide habitats for numerous invertebrates, which shorebirds feed on. Sri Lanka is the last stop for migrant birds journeying on the central Asian flyway route before they travel to the far south. The Puttalam mudflats are used as feeding grounds and resting sites. During the last few decades many of these inter-tidal mudflats have now been converted to salt terns and shrimp ponds.

Scrub forest

Scrub lands which are found only above the high tide level can be seen scattered around the Puttalam lagoon. Grasslands are also associated with scrub forest, which are the most dominant natural ecosystem type found in highlands of this region. Trees are few a meters in height and are very thorny. A common practice among the communities is the extraction of the roots of certain plants in the scrub forests, to be used in traditional medicine. In addition, fuel wood and materials used for construction are also collect from the scrubs. These practices as well as the expansion of coconut and cashew plantations pose major threats to the scrub forests. Manmade fires also contribute towards habitat destruction.

2.4. Issues and threats for the sustainable management for lagoon ecosystems

The main purpose of the Puttalam Lagoon Conservation Management Plan (PLCMP) is to address some of the threats faced by lagoon ecosystems and issues regarding their sustainable management of lagoon ecosystems. This section discusses such issues and links them with the next section on the project investment to clearly present the rationale behind the proposed investments. In the sustainable financing and benefits sharing context, this section provides some insights into the need to invest in activities for revenue generation and for benefits distribution.

Conversion of mangroves, salt marshes and scrub forests: Before the mid 1980s mangroves, salt marshes and scrub forest around the Puttalam lagoon were not impacted severely. After the mid 1980s, the situation in Puttalam completely changed due to two reasons - the sudden increase of shrimp aquaculture and the influx of IDPs in 1990s. Large areas of rich mangroves and salt marshes were converted into the commercial shrimp farms which expanded rapidly. In 1990 only 52 shrimp farms were recorded in the Puttalam area, by 1995 that number increased to 1,400³⁰ which covered an area of 4,539ha³⁰. Almost all the recorded shrimp farms were originally coastal ecosystems and out of that more than 900 farms are unauthorized.

Illegal encroachment of the IDPs as well as inhabitants also contributed towards the degradation of these ecosystems, which were inevitably converted into settlements, shrimp farms and salt pans. Mud flats and wetlands were filled up in order to increase the land area. Large scale commercial salt industries were established by the government in Puttalam and Karthieve. Conversion of mangroves and salt marshes still take place around the Puttalam lagoon. The most recent development is the conversion of these ecosystems and abandoned shrimp farms into salt pans for the salt industry run by the private sector.

Effluents discharge from the shrimp farms: Most of the pesticides, disinfectants and antibiotics used in the cultivation of shrimp farms have negative effects on the health and safety of adjacent ecosystems. The effluents discharged from the shrimp farms contain high levels of organic matter, nutrients, chemicals and antibiotics³². In Sri Lanka, the impact of shrimp farm effluent on other ecosystems such as lagoon ecosystems has not been assessed. But, according to findings in countries such as Thailand, it has been proven to have a serious and irreversible impact on ecosystems, aquatic species and on human health. Although there are no research findings on the impact of shrimp farm effluents on the lagoon ecosystems, the people living around the lagoon believe that physical changes in the lagoon ecosystem have been taking place due to the effect of the effluents.

Pollution from freshwater sources: The lagoon gets fresh water from a number of small streams around it, namely the Kala Oya, Mee Oya and Moongil ara. Land around these fresh water sources has been cultivated and intensive crop cultivations such as paddy, coconut, vegetables and fruit can be seen in these regions, as well as around the lagoon. Agrochemicals and chemical fertilizers are heavily relied on to ensure the successful growth of these crops. In addition, the area is prone to soil erosion due to the lack of proper soil conservation methods. The chemicals, nutrients and soil from the agricultural fields are fed into the Puttalam lagoon by these small streams. Nitrification is one of the impacts of the deposition of nutrients in the lagoon - its sedimentation can be monitored. The chemicals in the lagoon may also have a negative impact on the lagoon ecosystem, but more research on this aspect needs to be carried out before a conclusion is reached.

Garbage dumping: The dumping of garbage is a practiced by the communities around the lagoon. The municipalities in Puttalam, Kalpitiya and Karathieve collect garbage daily and dump it in open areas around the lagoon, for example in Thora adi odai which is situated 3km north of Kalpitiya. In addition, damaged fishing nets, old boats, plastic and non-biodegradable waste have also been dumped near the

lagoon posing a number of threats to the lagoon ecosystems as the lagoon water gets polluted and the scenic beauty of the area is lost.

Unsustainable exploitation of fisheries resources: In the lagoon area fishing practices have not been monitored and controlled. The increase in the number of fishermen in the Puttalam lagoon has added to the already existing pressure on limited fisheries resources. The use of destructive fishing methods also lead to the increase of the individual fish catch. The practice of destructive fishing methods was also adopted by the refugee population in Puttalam who did not have proper equipment and so had to resort to using fishing gear, which was harmful to the lagoon ecosystems. The distractive fishing gear used in this area is drag nets, trammel nets and push nets. The use of these nets damages the lagoon's vegetation and impacts most of the fish and shellfish species of every maturity level. A set time-frame to fish in the lagoon has not been allocated and so fishermen tend to take advantage of this and fish throughout the course of the day. In addition, some fishermen use motor boats in the shallow lagoon which damages the lagoon vegetation. The most recent trend is the use of a type of net which is approximately 100m in length and can cover a large area of the lagoon. Extraction of commercially valuable but rare species from the lagoon, for example sea horses, ornamental fish species etc. has become an extremely common practice. These destructive fishing methods mentioned above are unsustainable and affect the breeding grounds of fish, minimizing viable population of different species and may result in the total collapse of the fisheries industry in the Puttalam lagoon.

Sedimentation: Sedimentation of the lagoon bed has been identified as a major threat to the lagoon's ecosystem and has had an adverse impact on sea grasses and other habitats where the fish and shellfish species breed. Sediments enter into the Puttalam lagoon from rivers, streams, shrimp farms construction and abandoned salt pans. In addition large scale development projects such as road development projects are also responsible for the sedimentation of the lagoon. There is no adequate information available to show the impact of the sedimentation, but communities living in the area have acknowledged it as a serious issue.

Refugees: The people expelled from Mannar and Jaffna in the 1990s due to the ethnic conflict in the North and East, migrated and settled in the Puttalam district., There are approximately 66,200 internally displaced persons (IDPs) in Puttalam of which the majority are Muslims³³. IDPs account for almost 10% of the total population of the District³⁴. The sudden expansion of the population added pressure on the government to provide land for the IDPs to reside. Government owned environmentally sensitive areas were allocated, for example salt marshes were allocated to refugees to build their houses. As a result, the salt marshes in Puttalam have reduced from 1,434.9 ha in 1981 to 700.7ha in 1992³⁵. In addition, ecosystems such as mangroves and scrub forests have also been converted by the IDPS into settlements or economic activities such as salt pans and shrimp ponds. Due to the lack of employment opportunities, most of the IDPs who used to be fishermen started fishing in the lagoon using illegal fishing gear. This has created a huge pressure on the lagoon resources and has become one of the main threats faced by the ecosystems.

Mechanical boats: The fishermen in Puttalam lagoon use two types of motor boats, OFRP and MTRD, both of which have a negative impact. MTRD flat bottomed boats are 6-7m long and are made out of fiber glass reinforced plastic hulls. There are traditional crafts powered by outboard motor engines of 8 to 45 horse power. According to the 2006/07 census of fishing boats there are approximately 2,142 OFRP boats and 107 MTRD boats around the Puttalam lagoon area³⁶. Some of them are used in the lagoon as well as in near shore fishing areas. The boats which are employed only for near shore fisheries cross the lagoon everyday to go to the sea. This has led to the destruction of sea grasses, sea weeds and other lagoon ecosystems.

Illegal fishing methods and gears: Drag nets were first used in the lagoon around two decades ago. They consist of 15-18mm mesh and 3-6 ply. The main threat posed by this gear is that, it catches fish of all sizes and damages the lagoon vegetation, which is the breeding ground of fish and shellfish species. Push nets are commonly used. Made of size 3 mesh and 6mm ply, the push net is fixed onto a triangle shape wooden frame and then used to catch fish and shellfish by placing it on the shallow lagoon bed. Trammel nets and drag nets are both prohibited under the Inland Fisheries Management Regulations of 1996 and push nets are prohibited under the Fishing Operation Regulation of 1996³⁷ but all three are used by the majority of fishermen in Puttalam lagoon.

Development projects: rapid development is taking place within the BMZ project area. Nurachcholai coal power plant, Puttalam-Kalpitiya road, improvement of other roads near the coastal areas, proposed tourism development project are some examples. The negative impacts on the environment can already be witnessed. For example, due to the road development project a large number of mature trees, which were growing on both sides of the road have been cut down.

2.5. The project investment

The Puttalam Lagoon Conservation Management Plan (PLCMP) was developed based on the findings of studies conducted in 2007 and other previous project findings, recommendations and feedback from stakeholders. The management plan proposes the action that needs to be taken in order to ensure the sustainable management of resources in the lagoon. Based on the PLCMP, a set of actions to be implemented under the BMZ project as pilot initiatives were decided upon and prioritized. These are aimed at addressing environmental, socio-economics and institutional issues which hinder the sustainable management and conservation of the lagoon. In order to implement the selected pilot activities out of the range of conservation management activities in PLCMP, an investment plan was prepared within the limits of project funding availability, time period and the capacity of IUCN and other stakeholders.

Financial sustainability refers to the consistent supply of funding over time (Andrew K. Hurd 2003)³⁸ which is sufficient to meet the costs of implementing the PLCMP. In short, sustainable financing ensures basic costs are covered for the future. This section presents the project investments of the BMZ project for the select activities, future needs of financial resources to fully implement the PLCMP and current and future finance commitments/availability in other agencies to carry out some of the activities mentioned in the PLCMP or similar types of activities within the Puttalam lagoon area. Based on the above information the financing gap to (needs that will be financed by other sources) implement the PLCMP will be identified. Identification of the financing gap is essential in the preparation of a sustainable financing and benefits sharing strategy.

The information generated during the three year course of this project through the collaboration of IUCN with other stakeholders, is presented in summary below. It was made available to policy makers of the Puttalam district and it will be used by the LMA as well.

- Detailed Socio-economics and ecological assessment of the Puttalam lagoon border areas: The project plans to make concrete investments in ecosystem rehabilitation measures, to rehabilitate and thereby restore the biodiversity of specific ecosystems and to enhance the provisioning of ecosystem services which would ensure the well-being of the communities who depend on the lagoon resources. The aim of the BMZ project is to develop and implement activities that are based on a sound understanding of ecological and socio-economic conditions and needs. Since, the available information on socio-economics of the communities, biodiversity status of the lagoon and its surrounding environment was not adequate to do a comprehensive planning; two

comprehensive assessments were carried out. In order to select potential sites as well as areas of interventions under the project, an assessment was conducted in 15 potential sites around the lagoon with the aim of selecting a few key sites suitable to conduct environmental conservation management activities in. Further, the same assessment was used to generate required information to set a baseline to monitor the progress of the project interventions against it. Another detailed assessment was conducted to gather information on biodiversity of the Puttalam lagoon and its surrounding area. This provided a comprehensive data base on the biodiversity status of the lagoon and a baseline to be used by any interested individuals and institutions etc.

- Land use-zone based GIS maps and other decision-support tools summarizing assessment findings: GIS maps were prepared as supporting tools to plan and implement the PLCMP as well as to be used as a tool to influence decision making. The maps were prepared on land use pattern around the Puttalam lagoon, distribution of mangroves, ecologically sensitive areas, threats to the lagoon ecosystems etc. The maps were developed for 479.5 km² of lands around the lagoon. The area depicted in the map will be declared as a special management area and will be under the control of proposed LMA. In addition, an atlas has been prepared to present different information using GIS maps⁶.
- Identification of pilot site and verifications of other decision-support tools: During the assessment a scoring system was used to select the most suitable sites for the BMZ pilot interventions. A guideline was developed to take decisions on how to select suitable sites, investments etc.
- Site specific ecosystem rehabilitation and conservation plans as part of integrated land use planning.
- Stakeholder and institutional mapping to identify mechanisms and arrangements for implementing rehabilitation and conservation plans mapping.

Subsequently, based on the findings of the studies carried out during the project period as well as previous project findings, recommendations and stakeholder ideas, the PLCMP was developed. The PLCMP is a broad conservation management plan which includes different kinds of interventions and investment options in order to ensure sustainable management of the Puttalam lagoon ecosystems. The proposed investments in the Plan addresses issues such as threats, direct and indirect drivers of lagoon ecosystem degradation, institutional and socio economic issues which were affected due to the sustainable management of the lagoon and its resources.

According to the plan, the identified areas for interventions and investments are as follows:

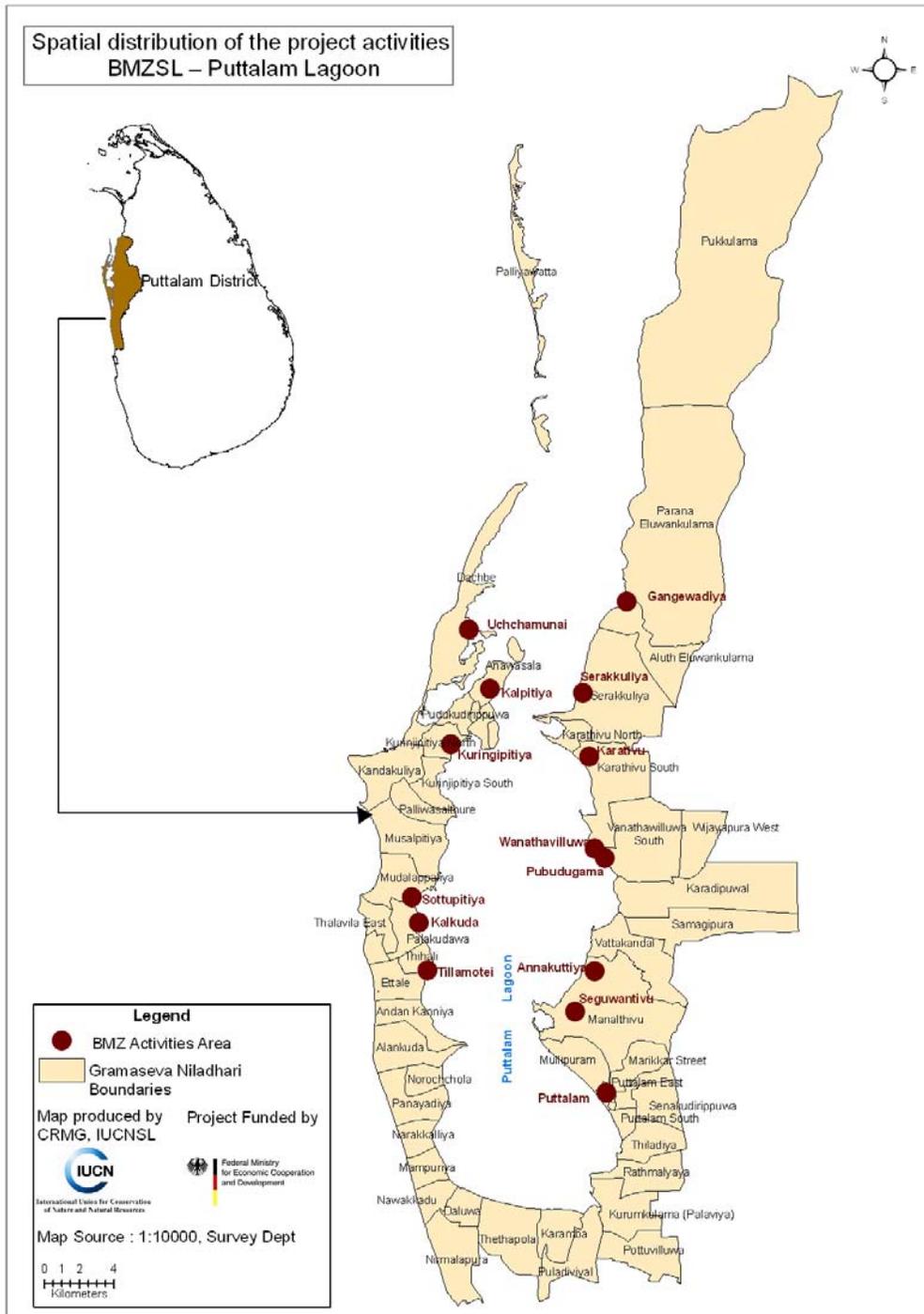
- Ecosystem Restoration and Biodiversity conservation
Activities have been selected to promote biodiversity conservation and the sustainable use of natural resources within the proposed special management area. Restoration of degraded mangrove areas and abandoned shrimp farms around the lagoon is one of the prioritized investment areas in the PLCMP. In addition, proper demarcation, measures to conserve the protected areas around the lagoon and to identify and declare new protected areas has also been proposed. As pilot interventions, restoration of abandoned shrimp farms in Thirikkapallama, solid waste recycling at Kalpitiya municipality area, household level compost making programme in selected villages, greening of home garden programme in Gangewadiya, Serrakkuliya and Soththupitiya, school ecological parks, and distribution of energy efficient stoves are some of the selected activities of the

⁶Refer, IUCN,2009, Un publish Report, GIS Atlas for Puttalam Lagoon – As an Assistance for decision making on natural resource management, Colombo, Sri Lanka, 5-6pp

PLCMP. In addition, many other activities have been proposed to support ecosystem restoration and biodiversity conservation.

- **Establishment of Sustainable fisheries management mechanism in Puttalam Lagoon**
One of the major interventions proposed in the PLCMP is to establish a mechanism for sustainable management of fisheries resources as well as other resources within the special management area. The proposed mechanism is to establish a Lagoon Management Authority, which would be a statutory body that can practice co-management of the natural resources and will consist of public stakeholders as well as community representatives. Some initial activities have been conducted to prepare a platform to establish the proposed mechanism. Linkages have been made with the other partners to continue this activity after the BMZ project period.
- **Sustainable livelihood development**
The development of sustainable alternative livelihoods for the fisheries communities is one area identified and prioritized in the PLCMP with the objective to reduce the pressure on the lagoon resources and promote the conservation of the ecosystems. Under the BMZ project some pilot interventions were planned and implemented in selected villages. For example, crab fattening in Tirikkapallama, value addition and promotion of fish marketing, the establishment of a mangrove park at Thillamotte, provisioning of sawing machine and training for the women in Thillamotte and Soththupitiya, promotion of livestock production in Theheliya, Soththupitiya and Sewanthiew, and establishing home gardens are some of the pilot livelihood interventions undertaken by the BMZ project.
- **Communication, education and awareness raising**
The need to raise awareness among the communities has been identified in the PLCMP and a series of awareness raising programmes were conducted under the BMZ project, for stakeholders and school children.
- **Promotion of good governance**
With the aim of strengthening the poors' right to resources and to address inequities (including gender inequities) linked to socio-economic factors, a process has been started to promote good governance under the BMZ project. Raising awareness among the various stakeholders regarding the issues at stake in the governance of natural resources, building partnerships with civil society organisations and influence for the change of policies to support natural resources governance are some of the activities undertaken by the project.

Figure 3: Spatial Distribution of the Project Activities



In order to implement some of the proposed conservation management activities in the broad conservation management plan four pilot sites were identified and some activities were implemented in the selected sites as pilot activities.

Under the pilot activities, site specific ecosystem rehabilitation along with conservation and investment plans were developed and appraised in terms of technical, economical and institutional feasibility and viability. Activities were implemented with the collaboration of stakeholders. The scale and number of activities were decided upon based on the project period and availability of funds in the project budget.

The following table summarizes the activities implemented during the project period and the estimated budget for each activity.

Table 4: BMZ Investments in Puttalam

	Activity	Activity description	Activity cost US\$	Remarks
Sustainable Fisheries Management				
1	Development of the fish landing site	The existing fish landing site was developed at Thirikkapallama	10,391	There are a number of landing sites which are not standard and a threat to the lagoon and other vegetations. Other landing sites also need to improve
2	Crab fattening and seaweed culture	To promote crab fattening and seaweed culture as alternative livelihood activities at 12 CBOs facilities were provided	10,371	Based on the success, can be introduced to the other areas
3	Strengthening District Fisheries Office	Equipments were provided to strengthening DFOs capacity to maintain data base other facilities	10,710	Implemented
4	Fisheries CBOs Capacity building	Capacity building of the Fisheries CBOs and provided basic office equipments	6,672	Implemented
5	Strengthening existing CBOs	Five CBOs were selected and supported to develop the facilities	10,710	Implemented
6	Construction of community Centre	Supported to construct a community center at Soththupitiya	5,446	Implemented
7	Construction of Community Centre	Supported to construct a community center at Kalkuda-Palakuda	6,381	Implemented
8	Construction of two toilets Kurungnpitiya		892	Implemented
9	Construction of Sanitation facilities	Sanitation facilities were provided to Kuruchnpitiya Fisher CBOs and 21 toilets to the households at Gange-wadiya	15,892	Implemented
10	Construction of fisheries storage facilities centre	The center to store the fish catch was constructed in Thihali	5,627	Implemented
11	Awareness raising and provisioning of fishing gears	Awareness of the fishermen was raised on the impact of destructive fishing activities and provided legal fishing gears for CBOs	10,539	Not implemented
12	Formation of Puttalama Lagoon Management Authority		1,089	After establishing the lagoon management authority, operation and other costs need to be earned
13	Promotion of Fish Marketing		2,592	This is one of the important area to get a good price for the lagoon fish production. More investment is required
14	Preparation of Fisheries Management Plan	A fisheries management plan was prepared as a guide to ensure sustainable fisheries management	572	
	Sub total		97,884	

Bio-diversity Conservation and Ecosystem Restoration				
15	Establishment of Mangrove Park	A mangrove park was established to promote nature based tourism activities and conservation with some alternative livelihood activities	24,011	There are other places around the lagoon where similar kinds of activities can be done
16	Greening Human settlements	Materials and training were provided for the households	11,254	
17	Energy efficient stoves 1000	In order to minimize the pressure on natural ecosystems for fuel wood, energy efficient stoves were distributed	2,588	Should be promoted in other villages around the lagoon
18	Greening home gardens		11,625	Can be promoted in other areas around the lagoon
19	School Ecological Parks	In order to promote conservation and enhance the interest of the students ecological parks were established	1,087	Need to provide support to improve the condition of the parks
20	Awareness raising on existing mangroves and importance of protecting them	Installation of 125 display boards on protected forest areas	12,079	Planned to established 75, based on the request of the stakeholders increased the number up to 125
21	Solid waste management	Support to establish solid waste management facilities in Kalpitiya municipal area as a measure to reduce the garbage dumping to the lagoon. Equipments provided and technical knowledge improved	37,373	More initiatives can be done out of the municipal council areas
	Sub total		100,017	
Sustainable Livelihood Development				
22	Provisioning Sawing machine & training	As an alternative livelihood activity to improve the income of fishers households 20 sawing machines, training and other inputs were provided	12,090	Based on the success, more initiatives can be made in other villages
23	Promotion of livestock production	As an alternative livelihood to improve the income small scale homestead poultry farms were provided	14,500	Based on the success, more initiatives can be made in other villages
24	Fish processing and value addition	Financial assistance was provided to promote fish processing and value addition activities	450	Based on the success, more initiatives can be made in other villages
25	Home Gardens	Supported to establish drip-irrigated home gardens as an alternative sustainable livelihood activity	18,261	Based on the success, more initiatives can be made in other villages
	Sub total		45,301	
Communication, Education and Awareness				
26	Environmental awareness raising programmes	Conduct environmental awareness programs for the stakeholders around the Puttalam lagoon	21,894	Needs to conduct more programmes
27		Communication and school awareness raising on ecosystem management	9,783	Needs to conduct more programmes
	Sub total		31,677	

Good Governance			
28	Governance	In order to promote good governance background preparation activities were carried out	12,233
	Sub total		12,233
Technical assessments, studies and plans			
29	Ecological assessment	In order to fill the gap of scientific information on ecosystems in Puttalam lagoon area ecological assessments of the ecosystems were conducted	46,090
30	Land use-zone based GIS maps	GIS maps were prepared to understand the land use pattern in the area and verify the other assessment findings	8,950
31	Stakeholder and institutional analysis and mapping	To understand the stakeholders for the lagoon resources management and to identify the appropriate institutional set up to implement the proposed PLCMP	3,880
32	Development of ecosystem rehabilitation and conservation plans	Site specific ecosystem rehabilitation and conservation plans were developed to undertake some activities at pilot scales in select sites	19,025
	Sub total		77,945
	Grand Total		352,824

The sole purpose of preparation of PLCMP is to provide guidance to all stakeholders to plan projects which will contribute to achieve the objectives of the PLCMP. Government agencies which receive annual allocations from the government as well as national projects, NGOs, CBOs and private investors will implement activities which contribute towards achieving the PLCMP goals or other supplementary activities which will directly or indirectly contribute to the conservation management goals. The investing of finances in conservation management activities carried out by other stakeholders should be taken into account as a part of the financial requirements to implement PLCMP. Assessment of future investments by the other stakeholders needs to be done, it is presumed that the part of the finance requirement in each year will be provided by the other stakeholders through their projects funding or annual finance allocations.

There are a few current and future funding opportunities from other organisations, particularly to implement activities related to the lagoon conservation and management in Puttalam lagoon area. For example DFID, FAO and MFF have committed to provide funding for projects which will contribute towards achieving some of the objectives in PLCMP. DFID provides funding for a project to improve environmental justice for rural poor while the MFF grant initiatives provides funding for nine small scale projects. The MFF large grant initiative has approved two grants for two years. One of them will be implemented by the Sri Lanka Nature Forum to promote community participation in integrated coastal management in North Western province and the other one will be implemented by the Environmental Foundation Limited (EFL) to increase resilience and adaptation of coastal and riverine communities to climate change and other threats by conserving the ecosystem services of the Maha Oya and associated coastal wetlands. FAO and Ministry of Fisheries are planning to implement a project on Fisheries Livelihood Development in Puttalam and Negombo lagoon areas. All of the project activities mentioned above supplement the activities in the PLCMP developed by the BMZ project.

The above are examples of investment by the other agencies in Puttalam lagoon area. Participatory annual planning of activities to be conducted during a particular year may help in avoiding duplication of activities and reduce the cost of implementation. Coordination and advocacy is needed to influence the other agencies to invest in some of the components planned by the LMA or to motivate the other stakeholders to provide funding to the LMA to implement the planned activities.

In the short term, there are some project funds which will be invested on some of the activities mentioned in the PLCMP. For example, to establish the LMA and promote good governance, the DFID project has provided financial resources for the year 2010. The above examples highlight that to implement the PLCMP part of the financial requirements will be received from the stakeholders after the BMZ project ends.

2.6. A summary of the institutional analysis & mapping

Under this Project, on-the-ground coastal ecosystem rehabilitation and conservation plans should be implemented via direct partnerships between civil society, government and the private sector. The project document states that effective institutional arrangements should be in place in pilot sites to facilitate participatory mechanisms for the implementation of coastal ecosystem rehabilitation and conservation activities through stakeholder partnerships. In order to do this, it is necessary to understand the current institutional arrangements. An institutional analysis and mapping exercise was conducted to identify, analyze and map the current institutional setup in Puttalam. Suitable institutional arrangements to carry out ecosystem rehabilitation and conservation measures were also identified. After the project period, the identified institutional mechanism will undertake all the activities to be implemented in the future which includes the establishment of lagoon management authority and operationalising the sustainable financing and benefit sharing mechanism.

This section presents a summary of the institutional analysis and mapping exercise as well as the identified institutional setup to implement the sustainable financing and benefit sharing strategy.

There are number of institutions at national, provincial and local levels responsible for coastal and marine resource management. In Sri Lanka the institutional setup and mandates for coastal and marine resources management are complex and difficult to understand, because in some cases management boundaries and mandates overlap. Two types of bodies can be identified clearly as policy making bodies and implementing agencies. In addition, the same agencies can be classified as national level institutions, provincial level institutions and local level institutions as well.

National level institutions: At the national level there are policy making bodies such as Ministry of Fisheries and Aquatic Resources (MF&AR) and Ministry of Environment and Natural Resources (ME&NR), and implementing agencies such as the Coast Conservation Department (CCD), Department of Forest (DOF), National Aquatic Resources Research & Development Agency (NARA) and Department of Wildlife Conservation (DWLC).

Provincial level institutions: The Provincial Ministry of Fisheries, the North Western Provincial Council, Provincial Environmental Authority and Wayaba Development Authority are the provincial level authorities.

Local level institutions: At the local level there is Divisional Secretaries and Local Authorities (Pradeshiya Sabaha). In addition, NGOs and CBOs can be found at all levels³⁹.

Table 5: National Government agencies, mainly responsible for CZM activities

Institution	District Office	Major Functions involved in CZM
CCD	There is no representative office in the district. Some powers have been delegated to the District Secretary & Divisional Secretaries	Carrying out surveys of the coastal zone and inventorising of resources, preparation of CZM plans, regulation and controlling of development permits and enforcement of setback standards, coastal protection.
DFAR	Assistant Director in Puttalam and Fisheries Inspector to service a cluster of villages	Administration, development, regulation and monitoring of fishery and aquatic resources
NAQDA	Has a Brackish water station at Pambala	Aquaculture Development, export promotion and planning
NARA	Has a regional station at Kalpitiya	Conduct research in aquatic resources & dissemination of information
CEA	Has an Environmental Development Assistant (EDAs) in each DS Division	Management and protection of Natural Resources, EIA and pollution control
FD	DFO in Puttalam	Management and protection of Mangroves
CTB	No office in the District	Promotion and Management of Tourism
LC	DLO based in Puttalam	Allocation of land for shrimp farming
M/Public Administration	District Secretary	Chair District coordinating committees enforce powers delegated by CCD, ED, LC, etc.
M/Public Administration	Divisional Secretary	Administration of the division enforce the powers delegated CCD, FD, LC, etc.
Dept. of Irrigation	District Engineer	Irrigation System & Water Management
DWC	District Officer	Monitoring of impact of development on protected species & sanctuaries
CCB	District Officer	Conversion of coconut land into shrimp farm
BOI	-	Incentives/tax exemption for BOI approved shrimp farms
MPPA	Regional officer in the district	Protection of lagoon coastal waters
CFHC	Manages a large anchorage at Kalpitiya	Construction, Protection & Management of Fishery Harbours
Sri Lanka Navy	Regional Camp at Kalpitiya	Deals with the security issues in and around the lagoon

Source: IUCN 2009 a; ADB-RETA⁴⁰

Table 6: Provincial Government agencies, mainly responsible for CZM activities

Institution	Major function in relation to CZM
Provincial Ministry of Fisheries (PMOF)	Responsible for policy making, planning and implementation of fisheries sector in the province in consultation with MFOR
Provincial Environment Authority (PEA) established under Provincial Environment Statue No. 12 – 1990	Management and protection of natural resources; administers EIA's relating to shrimp farms etc. as the approving authority
Wayamba Development Authority (WDA)	Promotion of agriculture and aquaculture in the province
Industrial Service Bureau (ISB)	Support Aquaculture Centre and PMOF

Source: IUCN 2009 a; ADB-RETA

Table 7: Fisheries Cooperative societies

FI division	Fish: Co-op Societies.	Member Ship.	Other societies	Member Ship.
Kalpitiya(I)	3	586	-	-
Kalpitiya(M)	14	2,194	-	-
Palakudah	13	956	4	120
Puttalam	3	326	-	-
Wanathavillu	7	489	2	85

Source: IUCN 2009 a; IUCN 2009

Nearly 40% of the fishermen are not members of any society, of these fishermen a large number are migrants from coastal villages.

In addition, a number of Business Associations and NGOs as listed below are functioning in the area.

- Business Association of Shrimp Farmers
- Shrimp Breeders Association
- Shrimp Farmer Business and Export Association
- Social & Economic Development Centre (SEDEC)
- Environmental Foundation
- Small Fishers Federation
- World Vision
- Rural Development Foundation
- FORUT
- Ceylinco Grameen
- Rural Banks

The overall fisheries and coastal zone management is the mandate of the Ministry of Fisheries & Ocean Resources (MF&OR). There are two departments, Department of Fisheries & Aquatic Resources (DF&AR) and Department of Coast Conservation (CCD) within the Ministry. Their mandates are

implementing the Fisheries and Aquatic Resources Act (including management regulation, conservation and development of fisheries and aquatic resources) and implementing the provision in the Coast Conservation Act, respectively. The National Aquatic Resources Research and Development Agency (NARA) is responsible for carrying out all the research in the fisheries and aquatic resources sector⁴¹.

The mandate of the Ministry of Environmental and Natural Resources (ME&NR) is the formulation of all policies at the national level in relation to environmental protection, conservation and management in Sri Lanka, and part of their mandate covers coastal and aquatic environments as well. The Central Environmental Authority (CEA) was established under the ME&NR and their mandate is integrating environmental considerations into the development process of the country⁴². In addition, the Department of Wildlife Conservation (DWC), Department of Forest (DoF) and the Geological Survey and Mines Bureau (GSMB) also function under the ME&NR with the authorization to maintain national parks, nature reserves, forest reserves and wildlife in wilderness areas; and to provision geo-scientific information, advice and services to promote and manage the mineral resources of the country for economic development while ensuring environmental sustainability and regulate the exploration and extraction and trading of minerals respectively⁴³.

There is a close relationship between the functions and mandates of all the ministries and departments mentioned above. They all have mandates and responsibilities in ensuring sustainable coastal ecosystems and resources management. In some cases the mandates of different departments overlap. This may work as an advantage or a disadvantage in the decision making process and the implementation of projects in coastal environmental areas. Often the lack of coordination among these agencies has resulted in the failure of sustainable coastal resources management in Sri Lanka⁴⁴.

The provincial councils have been established in Sri Lanka by transferring political and administrative decision-making authority from central government to elected bodies at lower levels by the Thirteenth Amendment to the Constitution (1987) and the Provincial Councils Act No 42 of 1987. It is an independent body which undertakes activities that had previously been undertaken by the Central Government Ministries, Departments, Corporations and Statutory Authorities⁴⁵. According to Act 42 the NWPC Ministry of Fisheries (MoF) and Environmental Authority are responsible for the management of fisheries and coastal resources within the province and integrating environmental considerations in the development process of the North Western Province.

The North Western Provincial Environmental Authority is an exception, because it is the only provincial council that has its own environmental statute. The environmental statute of the North Western Provincial Council is identical to that being implemented by the Central Environmental Authority in the rest of the country. However, the North Western Provincial council has its own provincial Environmental Authority to implement the provisions in their Statute. With the enactment of this Provincial Statute in 1990, the North Western Province Environmental Authority assumed jurisdiction within the province⁴⁶. This has provided an opportunity to accurately carry out the functions and duties of the provincial environmental authority. In terms of this project, it is an advantage for the smooth implementation of the activities.

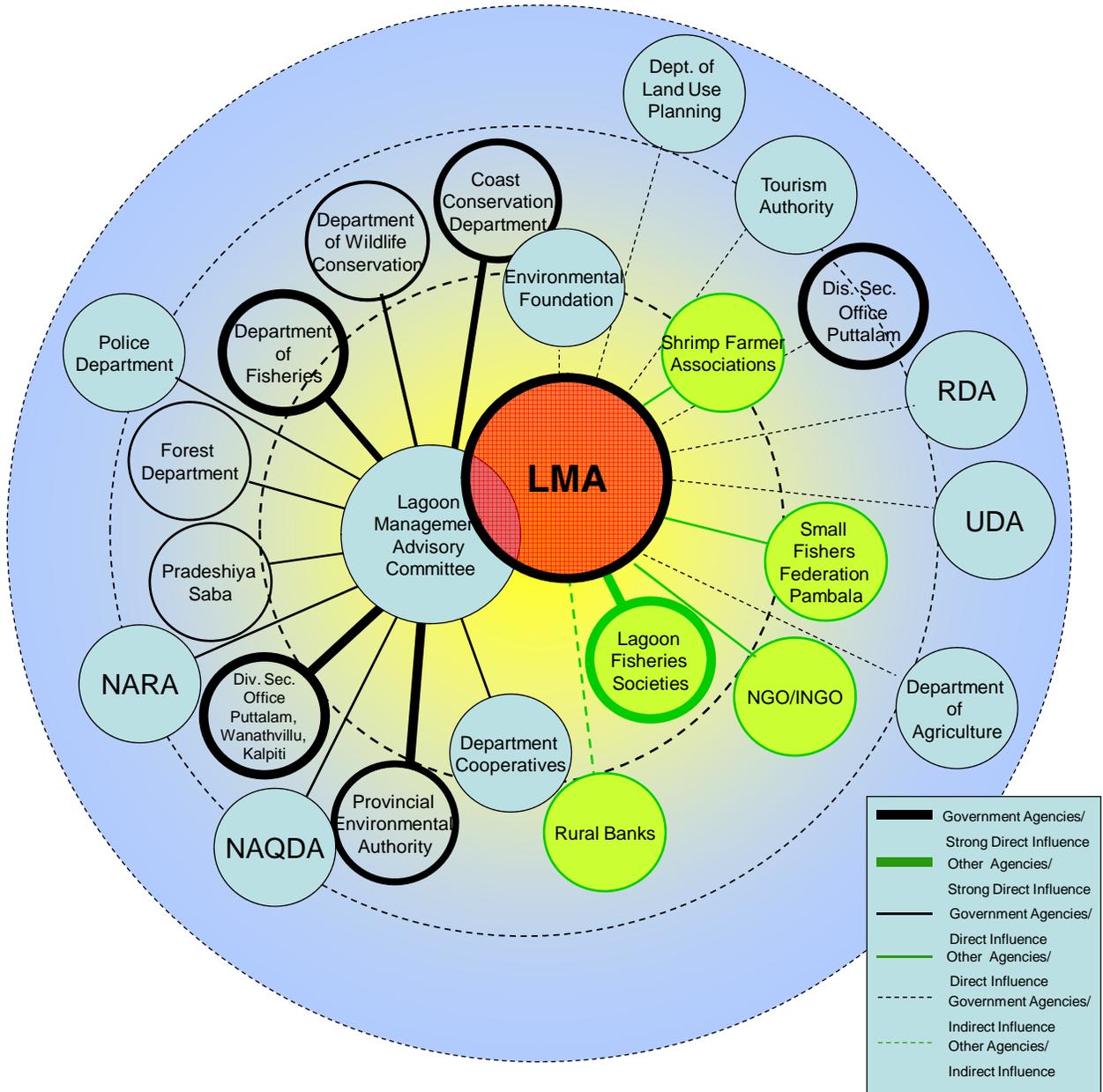
Department of Fisheries and Aquatic Resources district office in Puttalam is responsible for the fisheries management in Puttalam lagoon and the sea. Their mission is *“to provide an optimum contribution to the national economy through strengthening the socio-economic condition of the fisheries communities while maintaining the fisheries and aquatic resources in sustainable manner”*⁴⁷ and there are five

objectives to be achieved by them “*to manage, regulate, conserve and develop fisheries activities in a sustainable manner in conformity with national and international laws and conventions; to promote local and foreign investment in the fishing sector; to introduce new technology for the exploitation of fishery resources in national and international waters; to uplift the socio-economic status of the fishing communities; to ensure quality and safety of fish and fishery product exports in conformity with international standards; to minimize post-harvest losses and improve the quality of local fish products*”⁴⁸

There are five fisheries’ inspector divisions that come under the district fisheries office Kalpitiya Island, Kalpitiya main land, Puttalam, Wanathavillu and Talawila/Palakuda. There are approximately 40 Fisheries Co-operative Societies (FCS) in the area, but out of them very few are active. There are 12 active FCS in the project area as well as eight fisheries inspectors working in the district fisheries office. Five of these fisheries inspectors work with the FCS around the lagoon to ensure sustainable management of lagoon resources.

The Fisheries Co-operative Societies (FCS) are key stakeholders in this project and they will be the final beneficiaries of the project outcome. According to the activity plan for co-operative societies prepared in 2005 by the MF&AR, a FCS should function as a community organization with the objectives of resolving the problems faced by the fishing community and meeting their needs at the village level. It should also support participatory decision making, act as a mediator in solving the conflicts arisen among the fisher flock, provide knowledge required to the fisher folk and assisting in the implementation of the fisheries management plans⁴⁹.

Figure 4: Institutional Map



Key Legislations and Policy Decisions^d

There are a number of policy documents related to the coastal resources management in Sri Lanka. The following are some of the key points from legislation and associated policy decisions with relation to coastal zone management.

Coast Protection Unit established at the Port Commission 1963: The objective of the establishment of the Coast Protection Unit was to adopt a comprehensive approach to coastal erosion control. In 1978, the Coast Protection Unit was transferred to the Ministry of Fisheries and Aquatic Resources (MFAR) and functions as the Coast Conservation Division.

Coast Conservation Act No.57: In 1981, parliament enacted the Coast Conservation Act No. 57 of 1981, which is *"an act to make provision for a survey of the coastal zone and the preparation of a Coastal Zone Management Plan; to regulate and control development activities within the coastal zone; to make provision for the formulation and execution of schemes of work for coast conservation within the coastal zone; to make consequential amendments to certain written laws; and to provide for matters connected therewith or incidental thereto"*⁶⁰.

Coast Conservation Division upgraded to Department 1984: The Coast Conservation Division was upgraded to the Coast Conservation Department (CCD). The administration, control, custody and management of the coastal zone was vested with the Director, Coast Conservation. An amendment to the Act was passed in 1988 as the Coast Conservation (Amendment) Act No. 64 of 1988. This amendment modified general implementation procedures and system of penalties and introduced a range of new rules and penalties relating to coral mining. The department was further upgraded in 2009 July and the first Director General Coast Conservation was appointed.

Master Plan for Coastal Erosion Management 1986: This was developed with the financial assist from Danish International Development Agency (DANIDA). This plan identifies erosion prone sites along the coast where structural solutions to the erosion are appropriate⁵¹.

Coast Conservation Act Amendment (No.64) 1988: The legal framework for the Coastal Zone Management Plan was provided by this Act.

Coastal Zone Management Plan adopted by the Cabinet of Ministers 1990: The Coast Conservation Act required a survey of the Coastal Zone and the preparation of a Coastal Zone Management Plan (CZMP). The CZMP, prepared by the CCD, was adopted by the Government and implemented as the Coastal Zone Management Plan 1990.

Publication of Coastal 2000: Undertaken in 1992 this provided direction for Coastal Resources Management of Sri Lanka and recommends decentralized decision making and participation; collaborative programmes of monitoring status of coastal resources and outcomes; and research programmes through NARA and universities on both scientific and social and cultural issues.

Special Area Management Process 1993: This process was approved to provide the legal basis for local level Sustainable Area Management (SAMs) in Rekawa and Hikkaduwa.

Coastal 2000 policies adopted by the Cabinet of Ministers 1994: Policies promoting a broader and more integrated coastal resource management system proposed in Coastal 2000 were approved⁵².

^dThis section was adopted from the Mark Aeron –Thomas's document on integrated Coastal Zone management in Sri Lanka: A Policy Review. And modified for the context of this document

Fisheries and Aquatic Resources Act, No. 02 1996⁵³: Community based fisheries management through fisheries committees; declaration of management areas including inland water body, sea and lagoon areas, establishment of fisheries committees and authorities, and ways to transform committees and fisheries management authorities were part of this Act.

Revision of Coastal Zone Management Plan 1997: This sets the strategy for coastal zone management in to the next millennium⁵⁴. The Plan defines the problems and describes a management strategy to control coastal erosion, reduce the loss and degradation of coastal habitats such as coral reefs, estuaries and lagoons, mangroves, sea grasses beds, salt marshes, barrier beaches, spits and dunes and archaeological, historic and cultural monuments, sites and areas of recreational and scenic value. Furthermore, it addresses the coastal pollution from industries and urban centers⁵⁶.

Hambantota Integrated Coastal Zone Management Project (HICZMP) 1997- 2000: The procedures for coastal zone management extensively reviewed and plans developed for Hambantota District as part of this.

Coastal Zone set back limits 1997: This provides conditions for approval for the construction of dwelling houses. This has specified the set-back areas as 100m and 200m buffer zones respectively for western and southern coastal segment and northern and eastern coastal segment.

The second revision of Coastal Zone Management Plan, 2004: This aims to steer the CCD towards a role that places more emphasis on policy planning and greater involvement in facilitating and coordinating planned integrated coastal zone management. Further it has provided a better understanding on the status of coastal habitats, issues to be resolved and enabled the inclusion of management elements, preparedness for the future challenges of climate change and plan of action to implement the CZMP⁵⁷.

Other Policies Affecting Management of Coastal Resources^e

Fauna and Flora Protection Ordinance (No.2) 1937 with its amendments in 1970 (No.1) and 1993 (No.49): This allows for the declaration of protected areas for the conservation of plants, animals and ecosystems and gives protection to all marine mammals and reptiles⁵⁸.

Urban Development Authority Act (No.41) 1978: This allows for the preparation of a development plan in designated urban areas and applies to the coastal area that falls within them⁵⁹.

National Environmental Act (No.47)1980: as amended by No.56 of 1988: This allows for the protection, enhancement and management of the environment and for the prevention, abatement and control of pollution⁶⁰.

Mines and Minerals Act (No.33 1992: Allows exploration for, mining, transportation, processing and trade of minerals only under a license. *Section 66* effectively amended *section 14 (1)* of the Coast Conservation Act, taking some important powers away from CCD⁶¹.

Fisheries and Aquatic Act (No.2) 1996: Designed to manage, regulate, preserve and develop fisheries and aquatic resources it has application to certain resources in the coastal zone. *Section 31* of this Act allows the Fisheries Management Areas to be managed by a designated committee in which the participation of local stakeholders is mandatory⁶².

^e This section was adopted from the Mark Aeron –Thomas’s document on integrated Coastal Zone management in Sri Lanka: A Policy Review, and modified with new policies for the context of this document

National Physical Planning Policy of Sri Lanka 2007: Policies have been formulated for the protection of fragile environments and areas where forests, wildlife and archaeological sites are found. Suggestions have also been made to increase agricultural products by providing protection to areas suitable for various agricultural activities⁶³.

Wet Land Management Act No.35 2006: The Sri Lanka Land Reclamation and Development Corporation (SLLRDC) has been assigned the task of managing all declared wetlands in the country. The declaration of wetlands in the Western Province has already been completed in 2006⁶⁴.

An Addendum to the Biodiversity Conservation in Sri Lanka 2007: Each activity for 16 thematic/cross-cutting areas and Activity Plan with 45 prioritized recommendations including responsible agencies for implementation and time frames⁶⁵ are given in detail.

Provincial Biodiversity Profiles and Action Plans 2008: Integrate biodiversity conservation and sustainable use concerns into provincial economic development plans and activities⁶⁶.

In addition there are a number of guidelines for coastal zone activities. Among them two important guidelines are *A Basic Guide to Design & Planning of Coastal Green Belts in Sri Lanka*, UDA, 2005 and *Guidelines for Housing Development in Coastal Sri Lanka* (NHDA).

All lagoons in Sri Lanka, including Puttalam, are managed under the Coast Conservation Act of 1981 which mandates the Coastal Zone Management Plan implemented by the Coastal Conservation Department (CCD). In addition, the Special Area Management (SAM) approach, a resource management strategy endorsed in 1994, has some implications for lagoon resources management (Pathirana *et. al.* 2008). The Puttalam lagoon conservation management plan is aiming at establishing a Lagoon Management Authority for the Puttalam lagoon under the Fisheries and Aquatic Resources Act, No. 02 of 1996 and Coastal Zone Management Plan 2004.

3. Sustainable financing and benefit sharing framework

Goal

The ultimate goal of the financing and benefits sharing strategy is to raise financial resources to achieve the conservation management goals of Puttalam lagoon.

Objectives

The level of financing needed to transition from unsustainable to sustainable practices through implementing the sustainable management plan should first be understood. It is also necessary to improve the efficiency and effectiveness of already existing financing mechanisms thereby reducing the need for additional financing from new sources. Furthermore, poverty and equity of benefits distribution should be addressed, as it is one of the key conditions in sustainable resource management. Keeping these points in mind, the following objectives were set to be achieved by implementing this strategy.

The medium term objective is to provide strategies to raise funds from local, national and international sources to implement the Puttalam Lagoon Conservation Management Plan (PLCMP) which was developed under this project.

When the Puttalam lagoon conservation management authority is established, there will be a need to generate resources for the sustenance of the project management and activities costs as well as sustainable livelihoods and infrastructure development projects. Hence the long term objective is to raise funds from local, national and international sources to cover up these costs.

3.1. Necessary steps (Saima Baig 2010)⁶⁷

It is important to keep in mind that while soliciting funds for the project is an important part of any sustainability strategy, there are other aspects that must be considered. The following are the necessary steps for the proper planning and implementation of a sustainable financing strategy.

- Out of all the activities that were supported by the project, there is first a need to set realistic short, medium and long term investment priorities based on community preferences, government priorities and donor interest. For the purpose of the project activities these have been identified in terms of short and long term priorities.
- Once the priorities are set the next step is to assess what the expenditures and income are and what gaps exist. This requires a financial gap analysis to understand funds required to sustain both the short term and long term activities are laid out.
- The gap analysis will help to understand the short and long term funding requirements for specific activities and this information can then be used to set realistic sustainable financing goals. Developing a budget that includes direct and indirect costs, costs of management and opportunity costs is a necessary step for this.
- The next step is to identify, evaluate and select funding sources. Short and long term funding sources have been identified for the project and these need to be assessed in the face of the economic environment. A diverse portfolio would be more sustainable in the long run so a mix of funding sources would be beneficial. Furthermore, the stream of funding opted for should be timely and stable over a period of time.
- Effective financial management also requires that existing revenue collection is improved, and that part of the revenues generated from the area is invested back. Furthermore, a mechanism should also be put in place to capture offsite funding.
- In addition to strategic funding mechanisms, formulation and implementation of financial plans is necessary. This requires mechanisms for resource allocations and redistribution mechanisms, management and capacity needs and an implementation plan.
- A redistributive and benefit sharing system must be put in place to ensure that pro-poor conservation in the project areas is funded.
- Evaluation of the investment and measuring progress are needed so that the sustainable financing strategy can be adapted on a regular basis.

3.2. Legal and Institutional Framework for Sustainable Financing

The long term objective of this project is to establish a Lagoon Management Authority (LMA) for the sustainable conservation management of the lagoon resources in Puttalam. A clear guidance has been provided by the Fisheries and Aquatic Resources Act No 2 of 1996 for the establishment of Fisheries Management Authority (FMA). One of the main responsibilities of the Fisheries Management Authority will be the implementation of Puttalam Lagoon Conservation Management Plan. Availability of resources, especially financial resources is essential for the success of the conservation management activities. Therefore, financial sustainability is critically needed in order to finance the proposed lagoon management related activities. The Lagoon Conservation Management Plan has proposed the establishment of a fund that can be hosted under the LMA. The financial resources generated by implementing the sustainable financing strategy will be transferred directly to this Lagoon Management Fund. The LMA will act as the administrator of the fund as well as the implementer of the Lagoon Management Plan. Therefore, the LMA will be responsible for the implementation of sustainable financing and benefits sharing mechanism and the lagoon conservation management plan.

Under the Fisheries and Aquatic Resources Act No 2 of 1996 section 32 provides necessary legal provisioning to hold a fund with the FMA. Since the legal provisioning necessary to establish a LMA under the Act is limited, a FMA can be established in the short term to achieve sustainable fisheries management in Puttalam lagoon. When the Act is revised, a LMA with more power to manage the resources within the demarcated management area will be established. The revision of the Act is required because the current Act does not support the establishment of a co-management mechanism, which gives the power to manage different resources within the management area to both the community members as well as other government stakeholders that have the mandate do to so.

The institutional setup required to implement the Lagoon Conservation Management Plan and the sustainable financing mechanism including the operations of the Lagoon Management Fund needs to be identified.

Based on the guidelines provided by the Fisheries and Aquatic Resources Act No 2 of 1996, a FMA will be established in the short term. Twelve societies will be created based on criteria such as fisheries population in the area, number of Fisheries Co-operative Societies and land area. The FMA will consist of 12 members (one representative from each society). The declaration of the management area and the establishment of 12 fisheries societies (seven societies in Kalpitiya, three societies in Wanathavillu and two in Puttalam⁶⁸) will be needed. According to the Act, the FMA has limited power to manage resources other than for the fisheries resources. Necessary steps need to be taken to upgrade the FMA to the LMA, which will have a wider range of authority to manage all the resources within the territory of management area.

It has been proposed to create an advisory body “fisheries advisory committee” to the FMA and the composition will consist of:

- District secretary (Act as the Chairman of the proposed LMA)

Members

- Assistant director (AD) Fisheries department – Puttalam; the four divisional Secretaries from DS divisions Kalpitiya, Mundalama, Puttalam and Wanathavillu; representative from the forest department; representative from provincial environment authority; representative from department of wildlife; representative from department of co-operatives; representative from the Coast Conservation Department (CCD); representative from the National Aquatic

Resources & Research and Development Agency (NARA); representative from National Aquaculture and Development Authority (NAQDA); representative from the police department; Fisheries Inspectors (FI's) of the department of fisheries representing the lagoon area; representative from the Pradeshiya Sabha's of Kalpitiya, Wanathavilluwa and Puttalam and representative from the newly created 12 fisheries management societies (LMA)⁶⁹.

In order to establish the LMA, the Act No 2 of 1996 needs to include the powers and responsibilities of the LMA as a co-management body. No changes will be made in the composition of the FMA when it converts into the proposed LMA. In addition to the FMA members, there will be representatives from government agencies whose mandate will be directly or indirectly related to the lagoon, its resources management and dependent community development. The agencies have the decision making and political power to positively or negatively influence the sustainable management of the lagoon resources in the declared management area and so their inclusion is vital. Further, it will facilitate the implementation of the management actions without overlaps and issues.

Like the FMA, the proposed LMA will be a statutory body with the same responsibilities as the FMA, for example, 'formulating a fisheries programme for its area and implementing that programme; assisting its members to obtain boats, gear and equipment to be used in fishing operations; carrying out social infrastructure and welfare activities with a view to improving the living standards of the fishing community of that area.; and engaging in such other activities as are approved by the Director as beneficial to the fishing community'⁷⁰, and many other activities mentioned in the Act. In addition, the Authority may make recommendations to the Minister on 'the conduct of fishing operations and the use of different types of fishing gear in that fisheries management area; the establishment of closed seasons for fishing or closed seasons for the taking of specified species of fish in that fisheries management area.; and the times during which fish may be taken'⁷¹. The capacity of the LMA will be much broader in comparison to the FMA as its responsibilities will include the management of other resources within the management area, related decision making, fund raising and investment decision making etc.

The proposed co-management body will be a statutory body with the responsibility of making decisions and providing advice and support in managing the declared management area. It is still to be decided the structure and composition of the LMA, but the above fisheries advisory committee also will be a part of the LMA in addition to the members of FMA.

Section 32 of the Act, indicates that the FMA as a statutory body has the power to create a fund and manage it under the supervision of the Director (Fisheries). It has the power to carry out business transactions as well.

The short term implementation of the lagoon conservation management plan and sustainable financing strategy will be undertaken by the Department of Fisheries District Office with the collaboration of the Fisheries Corporative Societies (FCSs), which are currently functioning around the lagoon. After the establishment of the FMA, the statutory body will be in charge to implement the above mentioned plan and strategy. When the LMA is established the sustainable financing and benefits sharing strategy will be implemented. Since the proposed LMA has the responsibility and capacity to raise funds and manage them, they can directly coordinate with the potential funding sources mentioned in the strategy and implement the revisions to the current revenue sources and obtain resources to implement the Puttalam Lagoon Conservation Management Plan (PLCMP).

One of the objectives of creating the LMA is to define the property rights of the common property resources within the declared area. Therefore, after establishing the LMA, the property rights of the all the common property resources in the declared management area will come under the LMA. The LMA

can follow the guidelines provided in this sustainable financing and benefits sharing strategy and use the resources within their authorized area to generate sustainable revenues to finance the conservation management activities.

A fund will be created under the LMA which will accumulate all the receipts of money from the sources such as the government, donors, fines, royalties, fees and other sources which have been mentioned below. This fund will be called the Puttalam Lagoon Conservation Trust Fund (PLCTF). There is no rigid definition for trust funds, their structure, scope of activities and procedures will vary according to the purpose for which they were created⁷². The disbursement of funds can be done by prioritizing the activities planned in the PLCMP and allocate resources according to the availability of money and approval of projects. According to the PLCMP the fund should be spent on activities which support natural resources conservation management; up scaling the quality of conservation activities and the conservation movement in the management area; alternative livelihoods, basic facilities and infrastructure development for the lagoon fisher folk communities; strengthening community based enterprises, building the capacity of the fisheries communities, education and awareness raising programmes on sustainable resource use and conservation; and empowerment of community organizations and strengthening of NGOs and CBOs in the management area.

In implementing some of the proposed financing options, existing policies may need to be reformed in order to keep the revenues within the local authority or to request funding from other sources including central government and, to provide concrete economic incentives the reward environmentally friendly behaviour.

3.3. Coalition building

In the project area there are a number of local, national and international NGOs, involved in community development projects, ecosystem conservation and restoration projects. The government has been carrying out a number of infrastructure development projects in the area and the Ministry of Tourism has started a tourism promotion project in Kalpitiya. In addition, under the Mangroves for the Future (MFF) small grant and large grant initiative, NGOs are implementing activities which supplement the conservation management plan. The private sector has also been involved in environment related activities, for example Holcim Lanka Limited has been involved in waste co-processing and tree planting projects while other community projects such as a poverty alleviation project have been carried out in collaboration with Ceylinco Grameen Micro Credit finance programme. Projects which conserve endangered species in Wilpaththu National Park, provide assistance to ADB water supply project in Puttalam have also been supported⁷³. Networking and building coalitions with these government departments, political bodies and other organisations is key to the smooth implementation of a sustainable financing strategy. A good knowledge of local, regional and national institutional set-up under which a project/investment will be implemented and potential sources, which can provide technical and financial support to implement the components of the plan is necessary. This would assist in involving government and non-government agencies in the implementation of the project and in turn ensure that project activities are supported. Knowledge of the institutional set up will also aid the allocation and distribution of funds. It is necessary to have a clear strategy to deal with the all the stakeholder government agencies and higher level government agencies, political administration bodies, NGOs and private sector in order to promote sustainable management of natural resources and ecosystems in the area and to influence their activities so that environmental concerns are taken into account. Therefore, efforts should be made to establish a network with all the agencies mentioned above in order to implement sustainable environmental conservation and management activities with the financial, technical support and supplementary activities from the government and non government agencies.

There are large scale private sector investments around the Puttalam lagoon and their active participation is required in implementing the PLCMP, not only to provide financial support but also to implement supplementary activities and to incorporate environmental concerns into their own activities. In the Puttalam area the key actors are the aquaculture sector, coconut and cashew plantation sectors, the salt industry, hotels and the cement industry, whose activities have the potential of causing harm to the coastal environment.

3.4. Investment priorities

One prerequisite for developing a sustainable financing strategy is an action plan for the proposed project activities and resources needed to do it. Prioritizing the activities within the project, based on their importance and budgeting for the prioritized activities is also needed. It is difficult to think of a financing strategy without a budget (income and expenditure).

The BMZ project has developed a lagoon conservation management plan which requires all the activities to be implemented in order to achieve the conservation management goals. Activities to be implemented after the project period have been prioritized and cost estimates for the implementing of pilot activities have already been done. There is still a need however to estimate for the other activities such as organizational costs, capital cost and operational cost. Part of these costs can be covered by the existing income^f, the balance needs to be financed by other sources. This sustainable financing strategy provides the guidelines to generate the additional income in order to keep the project financially sustainable.

Sustainability, in terms of this project, doesn't only mean continuing ongoing activities but also includes the replication of pilot initiatives in other areas while increasing the magnitude and scale of current activities. As there are a number of success initiatives such as livelihood activities, infrastructure development, awareness rising programmes and building coalitions among the different stakeholders under this project.

According to the PLCMP, the following are prioritized activities to be implemented in the coming few years. They are categorized as short, medium and long term activities; the sustainable financing strategy is also based on the following.

3.4.1. Short term investment priorities

The short term goal of the project is to establish the FMA/LMA which will start functioning as an authority within one and a half to two years from the time of establishment. According to the 1996 Fisheries and Aquatic Resources Act, No. 02 several steps need to be taking to establish the FMA/LMA, and they will require a considerable amount of funding and time.

Special Management Area: The first and most important task is declaring the Puttalam lagoon as a special management area and designating a prescribed area of water and land around the lagoon. This is an essential step, as the decision making power of the LMA will be limited to this prescribed area. Designating the LMA controlled land and water will help avoid unnecessary clashes with the other authorities.

Lagoon Management Committee: The second step is to establish a lagoon management committee which is a statutory body that will make decisions on the management of the resources within the declared management area and will act as the forerunner to the FMA. The committee will consist of members from the registered fishermen residing in a fisheries management area. This is one of the steps that need investments to be made in the short term.

^f For further information see the section The medium and long term sustainable financing sources

Fisheries Management Authority (FMA)/ Lagoon Management Authority (LMA): Negotiations regarding the management model for the Puttalam lagoon management are still being carried out. Due to the limitations of the legal provisioning for the FMA, the Fisheries Department and other stakeholders have shown more interest in establishing a co-management mechanism rather than a FMA as it will have more power to make decisions regarding the resources in Puttalam lagoon and a wider representation of all the stakeholders. Unlike the FMA, the co-management body will have the power to take sustainable conservation management related decisions regarding all the resources within the special management area. Decisions will be made based on the ideas of all the stakeholders. According to the Fisheries Department Office in Puttalam, they are in the process of formulating the LMA: first they want to make a decision regarding the composition and power of the Authority and then to take necessary steps to revise the Act No 2 of 1996 accordingly. The DFID funded project is being implemented in the area, will continue from where the BMZ project left off, which is to promote good governance including the establishing the LMA. This process will take time to reach the expected status and during this time period it will require a fair amount of financial resources to carry out necessary activities such as advocacy, consultation and communication meetings and documentation activities etc.

Capacity building: Skills and capacity development are crucial to not only to implement and sustain projects but also to develop and put into practice any sustainable financing strategy. During the project period interventions aimed at building the capacity of the stakeholders of the project were carried out. Training and equipment was provided to the government agencies and the planning and implementation capacity of the FCSs in the area was enhanced. For example, the District Land Use Planning Division in Puttalam received technical training and maps to undertake mapping of land use planning in the district, the District Fisheries Department received transport facilities, equipment for awareness raising were provided to improve the capacity and awareness raising activities of the fisheries management, and a number of FCSs received infrastructure facilities to conduct community meetings. Although many interventions have been carried out still there are gaps in capacities and facilities required for the success of the conservation management activities in the future. In particular, the capacity of local communities needs to be built in order to develop financing plans, target funding opportunities and sources and undertake financial management. The FCSs have very limited finance management related knowledge and in order to manage the finances sustainably, capacity building is a must. The capacity of the institutions to effectively administer the financing process also should be enhanced. The success of the activities will be determined by the efficient role of the institutions involved in the sustainable financing.

Awareness Raising: Under the BMZ project a series of awareness raising programmes were conducted with the objective of *raising environmental conciseness among the communities and other stakeholders of the Puttalam lagoon area to protect the critical ecosystems of the area and enhance the sustainable resource use.* The target group was project stakeholders including the communities including the school children and teachers in schools around the Puttalam lagoon. The programmes were organised to raise awareness of sustainable lagoon resources management, Participatory Coastal Resource Management and Integrated Coastal Resource Management initiatives. Since these subjects are very complex, a series of programmes to address each level over a significant period of time needed to be conducted. Parallel to the other prioritized activities, continuation of the awareness raising programmes should also be prioritized in the short term as well as the medium term.

Advocacy: Although the process of promoting good governance, establishing LMA and implementing PLCMP initiated at the local level with the involvement and support of the local stakeholders, it needs to get the involvement and support from provincial and national decision making bodies. Active participation of these decision making bodies is needed to establish a suitable platform to achieve the objectives of the PLCMP. A strategy to advocate the importance of the project and its initiatives and the

need for support to change some of the rules and regulations in order to ensure the sustainability of the project to the higher levels of authority is required. Restoration of abandoned shrimp farms has become the flagship initiative in this project and the provincial environmental authority have played a major role in supporting the project team to release some of the abandoned shrimp farms in Thirikkapallama for restoration. Unfortunately the lack of support from other relevant government line agencies resulted in the team not being able to achieve their goals during the project period due to inadequate advocacy regarding the importance of this activity. Having a clear strategy to gain support from relevant line agencies such as District Secretary, Divisional Secretaries, Department of Survey and Department of Forest etc, is essential for the success of these initiatives after the project period. This cannot be done without providing the necessary information to the decision makers so that they make decisions, allocate limited resources and prioritize their involvement. The cost and benefits of the initiative should be calculated and other benefits that cannot be quantified also should be provided in a qualitative manner to the decision makers, as supporting tools to allocate finances, as well as to make necessary arrangements for the smooth functioning of the sustainable financing and benefits sharing mechanisms.

Livelihood activities: The BMZ project in Puttalam has given priority to the initiation of livelihood activities for the fisheries households that can contribute to the increase of household income and reduction of expenditure. This would in turn reduce the pressure on the lagoon and terrestrial resources and promote environmental conservation through best practices such as eco-friendly cultivations, water conservation and providing substitutes for environmentally harmful materials. Many of these activities have been successful and contribute significantly towards achieving the overall project goals and objectives. These activities can be replicated in other areas where the BMZ project interventions weren't conducted. Some of the initiatives under the project cannot be completed during the project period due to certain constraints and they will have to be continued after the project period ends. For example, the solid waste management project in Kalpitiya is one such initiative which may not be completed during the project period but will to be continued as it contributes greatly towards sustainable environmental management. In the short term replication of successful initiatives and the continuation of incomplete initiatives should be carried out and completed.

Monitoring and evaluation: Monitoring and evaluation of the activities conducted during the project period should be continued after the project end. This will help in understanding the progress, limitations, constraints, success or failures of the activities. This information will be useful when replicating the project activities in other areas and it can be used by stakeholders in future.

3.4.2. Medium and long term investment priorities

Activities in PLCMP which will need more time, financial resources, wider portfolio, research and pilot testing will be come under the medium and long term investment priorities.

Replication and up-scaling: Replication of activities and up-scaling the conservation and restoration activities need to be done to implement the conservation management plan in Puttalam lagoon successfully. This will require a lot of resources, ground work, time and planning as long term investment priorities.

Partnership building: In order to finance the activities in the conservation management plan, a broader portfolio of funding as well as diverse support from different agencies of expertise, financial commitments as well as other support to the LMA is needed. These activities can be easily implemented via partnerships with the relevant agencies, institutions or private sector and individuals. In the medium and long run, investments need to be made for partnership building. Further, activities need to be carried out to set up linkages for the exchange of information and knowledge such as marketing linkages etc.

Activities which require more time, resources and research: The PLCMP will introduce a number of alternative sustainable livelihood activities for the fisheries communities, for example cage culture, seaweed cultivation etc., which are currently not practiced widely in the area. To introduce these activities to the area more research, pilot testing and time is required to test their feasibility, efficiency and profitability. In addition, activities currently being implemented under the project also will be continued in medium and long term.

It is assumed that the LMA will be established and that operations will resume in the short term. The medium and long term investments should be made for the operation of the LMA and related administrative costs. There are some activities which will have to undergo a long process before they reach the implementation phase. For example to restore of abandoned shrimp farms the project team needs to go to court to get permission to carry out the project. Like most developing countries this will take a considerable amount of time due to inefficiencies, lack of capacity and political influences etc. Activities of this nature should be classified as long term investment priorities, although they may need short and medium term investments to fund.

Monitoring and evaluation: Monitoring the progress of the activities implemented after the BMZ project.

3.5. Gap analysis and setting annual goals

Although the conservation management plan is complex in nature and provides basic guidance to prioritizing and rationalizing the investments, when it comes to the implementation phase the activities should be prioritized and planned on an annual basis. A business plan needs to be prepared each year by the LMA with outlines the activities which will be implemented in the coming year. In addition, financial requirements, funding gaps and potential sources for funding need to be identified. A financing gap analysis is needed to indicate the funding required. This means that the managers should estimate how much money needs to be gathered through the sustainable financing mechanisms. Based on the planned activities, ground realities and experiences, the budgetary requirements need to be worked out in participatory manner.

4. Sustainable financing opportunities

This section discusses the past activities related to the sustainable financing of coastal resources conservation and management and identifies potential sources/options/opportunities for financing the Puttalam lagoon conservation management. In Sri Lanka, the Lagoon Fisheries Management Authorities have been established for a few lagoons, for example the Negombo, Rekawa and Panama lagoons and at present these lagoons are managed under a Fisheries Management Authority. Each Authority raises revenues to implement management actions. Their experiences of sustainable financing have been critically reviewed for this document. Their experiences in gathering funds to implement lagoon management related activities also will be taken into account when proposing financing options and opportunities for Puttalam Lagoon management. In addition, specific financing opportunities particularly those that will provide finances for the implementation of Puttalam Lagoon Conservation Management Plan are identified based on the assessments conducted in the area under the BMZ project and ADB-RETA project.

There are three special reports that have been prepared by different organizations and they were reviewed to identify options and opportunities for coastal resource conservation and management in Sri Lanka. Potential opportunities proposed by each report are presented below.

Report on strategic planning and market based instruments 2007. A report on strategic planning and developing market based instruments for the medium to long term strategic planning of the implementation of the Sri Lanka programme of action (MBI/NPA) has been prepared by the Ministry of Environment and Natural Resources (MENR) Sri Lanka in collaboration with UNEP. This report provides a background analysis of the application of market based instruments in Sri Lanka. Its objectives were to provide information on current application of market based instruments in national environmental policy in Sri Lanka; to assess the potential role of MBIs to generate funds for long term financially sustainable environmental investments which includes introducing new MBIs suitable for the political, economic and social situation in Sri Lanka.

The report provides information on current applications, potential MBIs in different sectors of the economy, recommendations on the revision of existing MBIs and the establishment of new MBIs. It recommends a detailed analysis of all the subsidies and subsidy reforms, alignment of fuel prices in accordance with the world oil prices increase in tax levied on transport fuels, and introducing a tax levy on the transport sector by incorporating environmental aspects, i.e, tax rate should be based on CO2 emissions or fuel consumption. An annual operation and maintenance payment for irrigation water, based on the amount of water used and output based subsidies for water consumption is also recommended, as well as a user fee for waste management. Product taxes such as taxes on batteries, packaging taxes, plastic bag tax etc., should also be allocated. A deposit refund schemes, disposal levies and tax rates on erosive crops in the agricultural sector as well as an increase in license, registration and permit fees in the fisheries sector is needed. Revision of entry fees for parks, user fees for the beaches from the hotels, restaurants and diving operators etc in the tourist sector is also recommended. Eco-labeling are some of the proposed reforms and new MBIs recommended by the report. These recommendations also can be considered in developing a sustainable financing mechanism for the Puttalam lagoon conservation management plan.

Environmental levy introduced in 2008: The environmental conservation levy was introduced by the Environmental Conservation Levy Act, No. 26 of 2008. An environmental levy has imposed on a set of specified items which are owned by individuals, imported, or manufactured in Sri Lanka. Specified services provided in Sri Lanka also considered for levies under this act⁷⁴. It was also decided that levies should be charged for the use of mobile phones, telecommunication towers, non CFL bulbs and petrol vehicles. A Rs.50,000 levy is now charged for the construction of a communication tower. Two per cent of a monthly mobile phone bill is charged as tax while three rupees is charged for the usage of non CFL bulbs. A levy of Rs.100 for motorcycles and Rs.300 for cars is collected per annum. The CEA targeted revenue of Rs.500 - 800 million in 2008 from these taxes was to be deposited in the Environment Conservation Fund⁷⁵.

The allocation of these funds during 2008 and 2009 is unknown but there is still potential to explore the possibility of reinvesting a certain percentage to the environmental sector. Since this fund is dedicated to the conservation of the environment, this is a potential government funding opportunity and a percentage of it can be requested from the ministry to implement the Puttalam lagoon conservation management plan.

Sustainable financing mechanisms and strategies for coastal and marine ecosystems in the Indian Ocean countries⁷⁶: This literature review document has identified sustainable funding mechanisms that are applicable to the coastal areas and coastal management actions, with reference to the MFF countries. A review of specific financial approaches and mechanisms that can be used in coastal conservation is also provided. The applicability of these approaches to specific industries in the coastal areas of the MFF countries was also examined and it has been concluded that some of the suggested sustainable financing mechanisms are highly relevant to the coastal resource conservation and management of these areas.

Based on the literature review of the sustainable financing mechanisms, the use of some of the suggested financing mechanisms has been proposed. Among them, charging park admission fees, users fees for diving and other tourist activities, payments for bio prospecting rights or PES, fiscal instruments for aquaculture, user fees to obtain licenses, vessels, or harvest tallies, taxes on sales of fishing gear and taxation for fisheries have been identified as some of the potential financing sources for coastal resources conservation and management project. Based on the ground realities, some of the proposed potential options mentioned above can be applied for the Puttalam lagoon conservation management.

Among the large number of sources for sustainable financing, increasing the revenues of self generating mechanisms is one of the best ways to obtain resources. There is great potential to strengthen existing and developing new revenue-generating activities, particularly for the lagoon management area to be established and managed under the LMA.

It is often necessary to combine local revenue generation with other types of funding to provide a constant flow of funding that is required for the implementation of the conservation management activities. The following options are drafted based on the conditions mentioned above. The options are presented based on their feasibility to generate funding in the **short term, medium and long term**.

4.1. Short term

Short term is defined in this strategy as the time required to establish the proposed LMA. According to previous experiences in Sri Lanka as well as the strategy itself, it will take approximately two years for the establishment to be completed. As mentioned earlier funding for ongoing conservation management

activities as well as commitments to provide financial resources for similar activities and a few other financing sources in the district are available and can be increased in the short term. These financial commitments will be made (some already have been made) by different organizations as well as annual national government, provincial and local government receipts to the relevant line agencies that have the mandate to manage natural resources. Based on the feasibility of raising funds within the defined short time period, the following options can be proposed as potential sources for the sustainable financing of the conservation management activities.

- **NGO Funding/ grants:** Over the last few decades Sri Lanka has received a significant amount of funds from NGOs to promote environmental conservation. A number of international and local NGOs specifically those specializing in conservation and sustainable development are carrying out on going project activities in the Puttalam district and commitments to fund these projects have been made. FAO and Department of fisheries project on Regional Fisheries Livelihoods Development is a project in pipeline with committed finding for the next few years and all of the projects mentioned above are complementing some of the activities planned in PLCMP. For example, the DFID funded project aimed at improving environmental justice for rural poor in Sri Lanka- Puttalam component is being implemented as a partnership between the IUCN-SL, The Public Interest Law Foundation (PILF) and the Centre for Environmental Justice (CEJ). It will be continued until 2012 with a total project cost of US\$.75,000. The project is basically targeting at improving natural resource governance for rural poverty reduction and will take over the BMZ activity 'promotion of good governance' to establish the LMA and continue the PLCMP as planned. Nine small grant projects in the BMZ project area are being implemented under the MFF small grant project with a total investment of Rs.4,251,210. The MFF large grant initiative has approved the implementation of two grants by the Sri Lanka Nature Forum to promote community participation in integrated coastal management in North Western province including the BMZ project area, the investment total is US\$.259,354 for two years (2010-2012). EFL has invested US\$.151,895 in a two year project aimed at increasing the resilience and adaptation of coastal and riverine communities to climate change and other threats, by conserving the ecosystem services of the Maha Oya and associated coastal wetlands in Puttalam BMZ project area. The FAO and ministry of fisheries will be putting into operation a project on Fisheries Livelihood Development in Puttalam and Negombo lagoon areas for which US\$ 2.4 million has been committed. Under this project they are planning to implement co-management mechanisms for sustainable fisheries management, activities to improve safety and reduce vulnerability, post harvest and marketing of fisheries resources, alternative livelihoods, micro finance services and knowledge sharing in regional level. All of the proposed activities under this initiative supplement the activities in the PLCMP developed by the BMZ project.
- **Government budgets/ allocation:** Funds allocated by national governments for sustainable development, environmental conservation management and for the special projects related to above goal are considered for line agencies. Every year the central and provincial government allocates a certain amount of money for the each government agency based on their requests. Therefore each agency prepares an activity plan annually, listing out the resources required to implement it during the coming year. For example, the Department of Fisheries in Puttalam has prepared an activity plan for the first quarter of 2010 which will be implemented with the fisheries community in Puttalam. In accordance with this activity plan four activities such as reorganization of fisheries corporative societies, uplifting the fisheries communities, sales promotion and development of fisheries corporative societies have been proposed. Under the above four categories there are a number of sub-activities, which cost approximately Rs.1,040,000 to implement. Another example for special project allocations is a project launched by the ministry of tourism which will develop tourism in the project area; some of their investments also supplement the PLCMP activities. Other government

agencies also annually allocate a percentage of finances to support activities in this area of which a number complement the activities proposed in the above plan.

- **Community funds and fees:** A number of productive FCS can be found around the Puttalam lagoon area with members, which actively participate in the implementation of activities and decision making. A Rs.20 membership fee is collected from each member monthly and Rs. 100 is saved per month. These funds are then used for different purposes based on the capacity of the FCS officers. For example, some FCS use the fund as a revolving fund to lend to its members while others use it to buy necessary equipments and infrastructure development. These funds can be utilized to implement prioritized activities within the relevant area of the FCS. Information regarding the value of the fund is not available, but when the number of members in each society is considered, these societies should have a sizeable amount of funding.
- **Private investment/ funds:** Funds are also provided by businesses and other private entities for conservation activities as part of their corporate social responsibility programmes. For example, Holcim Lanka Limited annually allocates a percentage of their finances to promote environmental conservation and community development around the area where they extract natural minerals for cement production. There are few industries which use the natural resources from the lagoon area for their production i.e. salt industries and aquaculture farms. There is potential of gaining financial support from these industries to promote conservation management activities. In addition, there are banks and multilateral investors who have CSR funds but do not know the best methods to utilize them. In the short term, the department of fisheries and other stakeholders can explore the possibility of tapping these funds to finance the planned activities.
- **Partnerships:** There are partner agencies who received benefits from projects such as the Land Use and Planning Department office in Puttalam. They are in the process of gathering funds to implement a five year plan to map out land use in the entire district. Building partnership with organizations like this will be beneficial for both the lagoon management authority as well as land use planning department.

All the funding sources mentioned above as short term sustainable financing sources should be coordinated by the Department of Fisheries Puttalam office in the short run until the LMA is established.

4.2. Medium and Long term

Medium to long term is defined as the time period after establishment of the LMA. The medium and long term sustainable financing sources mentioned below require preparatory or background activities to be carried out. For example, in order to be used some of them need the existing laws and acts to be revised while others require proposals to be developed and negotiations with the relevant funding agencies to be held. Taking into consideration the many factors that may delay the process of gathering funding the following potential sustainable financing mechanisms are categorized as medium and long term sustainable financing options.

- **Self generating:**

Taxes, fines, licenses, and permits: Currently the department of fisheries undertakes activities such as registration of fisheries boats, renewal of fishing boat registration, issuing of operational licenses, insurance of fisheries boats, registration of large fishing nets call '*Ma Del*', issuing identity cards for fishers, filling court cases for illegal activities and issuing fitness certificates for the boats. For most of the services they provide a service fee is charged, for example to register a boat that is more than 32 feet long Rs.500 is charged, for renewal of the same registration Rs.250 is charged annually and to

transfer the ownership of the same boat Rs.250 is again charged. These service fees were introduced in 1998, therefore revisions based on current conditions should be made

In 2009 the District Fisheries Office generated a revenue of Rs.1,012,875 from the different activities mentioned above. The Fisheries Department carries out raids to identify individuals who do not comply to the Act and court cases are filed against the culprits. According to the Act “*Any person who contravenes or fails to comply with the provisions of section 15, 16, 17 or 22 of this Act No 2 of 1996 or for any order made under section 30 shall be guilty of an offence under this Act and shall, on conviction after summary trial before a Magistrate be liable to a fine not less than two thousand rupees. Any person who contravenes or fails to comply with the provisions of sections 6, 28, 29, 34, 35 or 39 of this Act shall be guilty of an offence under this Act and shall on conviction after summary trial before a Magistrate be liable to imprisonment of either description for a term not exceeding six months or to a fine not less than three thousand rupees or to both such imprisonment and fine*”. For example, District Assistant Director of the Fisheries and Aquatic Resources Department filed 928 cases before 11 Magistrates against illegal fishing and misuse of ocean resources and the Ministry has collected Rs.414,500 as fines on such activities in 2009⁷⁷.

Although the Fisheries Department District Office generates the above mentioned revenue they cannot reinvest it in their activities. Instead it is transferred to the Fisheries Department and then to the treasury. In the long run, there is a need to revise the Acts and laws to enable the Fisheries District Office to use a percentage of the generated revenues to support conservation management activities in the long term.

Community based return on investments: Investments by the FCS in different economic activities generates profits. The BMZ project community owned farm in Thirikkapallama is a good example. The community collectively maintains a farm in a common land and their monthly net income from the farm is approximately Rs.15,000. This is a good example for the sustainable financing as the generated income can be invested in other possible sources and profits can be used as a financing source for their livelihoods and conservation management activities. In addition, there are a large number of abandoned shrimp farms around the lagoon which can be used for non destructive investment activities such as cage culture and seaweed culture etc.

User fees: These are fees applied for the use of a resource such as a protected area. It can also mean fees charged for the use of specific services provided by the resource. In the Puttalam lagoon area the lagoon water is used as an input for salt production and shrimp aquaculture. At present there is no mechanism in place to charge a user fee for the use of water resources. In addition, there are a number of protected mangrove areas which can be used to promote tourism and earn revenues from charging an entry fee from the tourists who visit these areas. In the long run generating user fees is one of the potential sources for sustainable financing.

- **Bilateral and multilateral donors:** Bilateral and multilateral donors are the largest funding sources for conservation management of ecosystems and natural resources and community development in Sri Lanka. These donors including the EU, FAO, UNDP, GEF, FAO, UNESCO, NORAD, USAID, AUSAID, DFID, WORLD BANK, ADB, CIDA, JICA, IDRC and SDC etc., have played a significant role during the last few decades and still they are depended on heavily for the funding of conservation initiatives and community development. The proposed LMA can interact with these donors through an advisory committee and apply for funding. For example, in 2008 Sri Lanka has received US\$170,959,194 from 25 donor countries⁷⁸ as humanitarian assistant which also included allocations for environmental conservation and management. Annex II provides a list of potential Bilateral and multilateral donors for fund raising.

- Foundations and Non-governmental organizations:** International NGOs raise millions of dollars for projects in Sri Lanka. Some of the NGOs directly raise funds for environmental conservation while others allocate a certain percentage of their project money to incorporate environmental aspects into their projects or to implement environmental related activities; at present this has become an essential part of development projects. These NGOs receive funds from foundations, donor agencies and charities. The proposed LMA can interact with the national and international NGOs and request funding needed to implement conservation management activities in collaboration with the NGOs, or advocate them to build environmental component into their development project and request funding through that to finance some of the activities proposed in PLCMP. In addition, the LMA can interact with donor foundations and charities and request funds directly. For example, in 2008 foundations and NGOs have provided US\$ 34,138,014 as donations⁷⁹ to implement different kinds of projects in Sri Lanka. Annex II provide a list of foundations and NGOs.
- Private sector:** The private sector actively participates in sustainable natural resources management initiatives as a part of their business activities. In addition they provide financial support to the government as well as to non government organizations to implement innovative initiatives for the sustainable management of natural resources. Corporate Social Responsibility (CSR) concept is widely used through-out the world to finance natural resources conservation management activities. The World Business Council states that "*Corporate Social Responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large*"⁸⁰. By adopting this concept, companies integrate social and environmental concerns in their business operations. Most of the large scale national and multinational companies maintain a CSR fund and in some countries tax exemptions are provided for the disbursement of such funds locally. For example, in Sri Lanka there are a number of banks and private companies that have CSR funds. Tapping into these CSR funds to finance the PLCMP is a good option. A feasibility study needs to be carried out before this is counted as a financing source.
- Tourism revenues:** Sri Lanka is one of the hot spots for tourism in the world and recently has been nominated as the number one place to visit by the New York Times. During the last decade approximately half a million tourists have visited Sri Lanka annually. Thus a huge increase in the number of tourists in coming years can be expected. Kalpitiya in the BMZ project area has been nominated as a one of the prioritized area for tourism development and a plan has been prepared to promote tourism activities in this area. A large scale tourism development project with an investment of Rs. 400 million has been proposed for the area. The Sri Lanka Tourism Development Authority hopes to create 15,000 direct employment opportunities and 50,000 indirect employment opportunities under the Kalpitiya Integrated Tourism Resort Development Project. The Puttalam lagoon has a high potential to promote nature based tourism, for example the mangrove swamps in Mee Oya and Kala Oya and isolated islands and mudflats are ideal for the nature based tourism. In the long run the LMA can design a strategy to engage in the tourism industry and generate financial resources for the PLCMP. In addition, the Wilpattu National Park, one of the best wild life tourism destinations in Sri Lanka located next to the Puttalam lagoon within the BMZ project area has been opened. These initiatives will lead to a tourism boom in, which in turn will provide a huge potential to generate resources for conservation. Systematic planning and sound strategy is needed to gather revenues to finance PLCMP.
- Voluntary contributions from tourists and tourism operators:** There are tourists who are nature lovers and recognize the real value of ecosystems and would be willing to contribute to manage the

ecosystems in a sustainable manner. The tourism operators also recognize the value of the ecosystems for their business and would be willing to contribute towards conservation management efforts, because it is a one kind of investment that can yield a higher return in future. A mechanism should be arranged to collect the voluntary donations by the tourists and tour operators. For example, in Sri Lanka there is a system to collect charities for different purposes by putting a box in public places like banks, supermarkets, airport etc. The same method can be used to collect voluntary donations by putting a box in places where the tourist stay and visit with a relevant message stating for what purpose these donations will be used. This option may not be feasible to implement in local level and will need national level involvement to be initiated. A certain percentage of donations can be requested to be re-invested in Puttalam. It is necessary to have a national level strategy and mechanism to collect and distribute such donations.

- **Real estate and development right:** After the LMA is established the property rights of the lagoon and the surrounding land, which are at presently owned by the government along with the special management area will be managed by the LMA. Already there are abandoned land areas which can be utilized for eco-friendly economic activities such as shrimp, aquaculture farming within mangroves (Indonesian system) and saltpan developers. Already degraded land can be leased to investors to generate financial resources. Although there is a tax system for real estates in the local level, it is limited only to the city. There is a potential as well as an economic rationale to expand this to the other areas as well and increase the amount of tax. At the moment the taxes are collected by the Municipal Councils and a small percentage of it can be obtained by the LMA to finance conservation management efforts. A system to trade development rights or pollution rights can also be introduced to finance conservation. This system permits the environmentally destructive development in certain areas while restoring or protecting the natural environment in other areas. Further, using advocacy, project developers (which are to be implemented within the LMA management area) can be influenced to build a strong environmental component in their development projects and allocate a percentage of their resources towards environmental conservation management.
- **Fiscal instruments/EFR:** This is a prospectively feasible intervention which needs national level support and the willingness to reform accordingly to facilitate EFR for it to be successful. Wider coverage of all the potential sources where the environmental related revenues can be generated using fiscal tools at the national level is also needed along with a more comprehensive and systematic approach to ensure adequate amount of revenues go back to the environmental sector as investment. EFR is one option that can be brought into the national fiscal systems to achieve the twin goals of reduce environmental degradation and increase revenues. Environmental conservation levy introduced by the Environmental Conservation Levy Act, No. 26 of 2008 and the water policy to economize the usage, appropriate pricing to prevent wastage and over exploitation and attaining public consensus through awareness on the need for reaching sustainability⁸¹ are some examples of initiatives that have been applied at a national level.
- **PES/CES:** Ecosystems provide services for the communities but in order to have a sustainable provisioning the ecosystem, owners have to protect them and this means a cost on the ecosystem owners. Arranging payments for ecosystem services (technically called Payment for Environmental Services (PES) or Compensations for Ecosystem Services (CES)) provided by the ecosystems is a way to recognize their value and to encourage landowners to manage resources in a manner that ensures that they continue to generate the environmental services. This interaction generates financial resources which encourages the conservation and sustainable management of ecosystems. In that sense, PES/CES schemes can help mobilize sustainable financing for conservation of ecosystems.

5. Benefit sharing

This section discusses the benefits sharing mechanism needed to be established in order to share the natural resources benefits with the objective to address poverty and unsustainable resource use, equity issues and behavioral changes of the resource dependent communities. A prerequisite to establish a benefit sharing mechanism is identification of the needs and niches for benefits sharing and institutional arrangements to share the actual benefits among the stakeholders. In order to implement a benefits sharing mechanism, there is a need to identify a). What benefits are generated locally, nationally and internationally from the lagoon ecosystems; b). What will be the changes in benefits generation after implementing the PLCMP; c). What are the needs and niches for benefits sharing; d) What are the institutional arrangements to share the benefits among the stakeholders.

The direct interventions of the project benefitted different groups of the communities, especially those who got the support to start livelihood activities gained more than others from the project; but the aim of the project is not to provide the benefits only for a group of people but also to distribute these benefits in a fair and equitable manner. Although there are different definitions of equity and benefits distribution, it generally means that benefits from a resource or an intervention are distributed in a fair and reasonable manner. How this principle is applied depends on policies, regulations, formal and informal laws, the specific ecosystem, economic sectors and other ground realities⁸². There are several steps to be followed to proper design of a benefit sharing strategy (Saima Baig 2010).

- Identify and assess the types of ecosystems used by all stakeholders and the benefits accrued from these and current benefit distribution pattern;
- Identify the beneficiaries of the ecosystem services and how they use the services and identify the groups who get more benefits than the cost;
- Identify the groups who bear more cost due to the project interventions than the benefits from the project and the ecosystems;
- Identify the reasons for unequal and unfair benefits distribution within the groups, due to reasons such as access, rights or other issues including gender roles, ethnicity etc;
- Identification of existing benefits sharing mechanisms and the most suitable way to propose a benefit sharing mechanism without distorting the existing systems;
- Assess the institutional and legal framework that governs access and rights and identify a suitable mechanism to implement the benefit sharing strategy.

There is a possibility that problems may arise and have a negative impact on the society as a result of the proposed benefit sharing activities. Understanding the potential social impacts and issues is essential in designing the strategy and proposed mechanisms. Guidance on how to overcome such barriers should be provided during the implementation phase. While the proposed strategy may be very efficient and cost effective, the impact it has at the local level may lead to inequalities and inequities or social conflicts. Therefore, identification of all actors and stakeholders, their roles and responsibilities along with the impact that the investment may have on them must be evaluated and based on this an equitable redistribution and benefit sharing mechanism must be developed.

The long term goal of the benefit sharing strategy is to assess statutory, formal and informal community property, access, use rights and distribution of cost and benefits, and then (Saima Baig 2010):

- work towards creating an enabling environment for equitable benefit sharing through policy advocacy, institutional strengthening and capacity building;
- promote a rights based approach by increasing opportunities and options for community management rights and stewardship arrangements.

The practice of benefit sharing is not a new thing in Sri Lanka. In rural areas natural resources benefits are shared voluntarily by the resource users of the community and no formal institutional arrangements for sharing the local level benefits exists. For example, part of the fish catch from the lagoon is shared with relatives or neighbors. Without a formal guidance, some FCS have already initiated a mechanism to share some of the benefits from the project interventions.

Benefit sharing can be done at a micro level as well as a macro level. The micro level is within the FCS level, because they can clearly identify the benefit receivers and there is an existing mechanism to share the benefits within the community level. It will be efficient, cost effective and transparent, because all the decisions will be made based on the participation of the community members. The macro level consists of natural resources benefits and project intervention benefits beyond the community level such as benefits in district, regional, national or global level. Sharing of macro level benefits can be done through the proposed LMA, because it will have the necessary power and capacity to deal with complex situations unlike the FCS.

Theoretically, cost sharing also comes up with the concept of benefit sharing. Cost sharing is one approach to providing sustainable finances for environmental conservation management and to ensure equity as a result of project interventions. It has been widely used as a conceptual and practical approach and provides incentives in the form of cost share payments to implement conservation practices in many countries.

However, cost-sharing is often taken to imply that costs from environmental conservation management interventions should be borne in proportion to benefits received⁸³. For example, there are direct and indirect benefits as a result of the BMZ interventions in Puttalam lagoon area. The benefits of the interventions will be received for the communities or individuals who are directly involved in conservation management activities as well as those who are not involved in such activities. There are also direct and indirect cost (opportunity cost) from conservation management activities (people have to restrict some of the activities carried out in the lagoon as a result of the project interventions, provide labour and other support for conservation management activities etc.). In some cases, the benefits used by the individuals or communities may be greater than the cost or the cost being borne may be greater than their actual net benefit. It is commonly believed that the cost of environmental conservation management activities should be borne in proportion to the benefits received.

Guidelines to identify the direct and indirect cost and benefits will be provided below under the economic valuation of lagoon ecosystem services.

5.1. Assessment of benefits, needs and niches for benefit sharing

Economic valuation techniques can be used in assessing the different values of the lagoon ecosystem goods and services. Systematic analysis of the benefits, costs and their distribution locally, regionally, nationally and globally as well as among the different groups in the society can be disaggregated. Based on the analysis the needs and niches for benefits sharing can be identified to design and initiate the benefit sharing mechanism.

Better documentation and analysis is needed for effective promotion of practices which will help minimize the risk of conflicts, inequities etc. Peoples' behaviour is dependent on the net gains they receive from the introduced management strategy and in order to ensure long term sustainability there needs to be some sort of incentives as compensation for restricting some of the activities which were negatively affecting the sustainability of the ecosystem. If the benefits and direct and indirect costs of the conservation management activities are distributed unequally, the sustainability of the project initiatives cannot be guaranteed and may fail to achieve the expected goals. In order to ensure sustainability, equity in benefit sharing, the contribution of stakeholders is required. The whole purpose of benefit sharing is to create a win-win situation or at least a win-no regret (Robin Mearns 1996)⁸⁴ status among the stakeholders due to project interventions.

Benefit sharing needs and opportunities

This requires a detailed analysis of benefit generation from the project interventions including the rehabilitation of degraded ecosystems, livelihood supports, infrastructure development, capacity building etc., as well as an analysis of cost distribution or identification of worse off communities due to the project interventions. The analysis will help in identifying the group who receives more benefits than the cost as well as the group who bare more cost than the benefits receives. The first group is the niche for resource generation and the second group is the target (need) for the distribution of generated resources. The section on economic valuation provides a clear guideline to identify this properly.

Although there are no proper assessments of benefits from the project activities or sound science based benefits sharing mechanism, different FCS follow different methods in sharing benefits from the project. For example, selected households in the BMZ project area have got assistance from the project to start alternative livelihood activities as a measure to reduce the pressure on natural resources. The assistance was given through the FCS and some of the FCS have design a mechanism to ensure equity and fairness among the members of the society through the sharing of benefits from the project activities. For example, 20 sewing machines have been provided to women in Thillamotte and Soththupitiya. The FCS has designed a mechanism to reimburse the cost from the beneficiaries and use the reimbursements to support other members to start new livelihood activities or to improve the existing activities. As the first step Rs.2000 from each beneficiary has been reimbursed.

Poultry farming has been introduced to the fisheries community as an alternative livelihood activity in Theheliya and Soththupitiya. All the resources have been provided by the project for the first round of poultry. The beneficiaries have agreed with the FCS to reimburse Rs.500 for each round of poultry. The society plans to provide part of the funds to the other households who did not receive any benefits from the livelihood improvement project activities. Loans up to Rs.5000 per members will be granted to those households to buy new fishing gears. The loan will be recovered within five months and interest is Rs. 500 for these five months.

A few FCS that were supported by the BMZ project have not yet started sharing project benefits with the community members. For example, cages to be used for crab fattening have been provided to the FCS

in Thrikkapallama. The beneficiaries add value to the immature crabs by putting them into a cage for one and a half to two months. They would earn approximately Rs.1,500 per crab.. But the FCS has not thought about how to distribute the benefits in a fair and equitable manner.

Promoting home gardens in fisheries villages is a major component of the project. In Thrikkapallama, the members who received assistance from the project are maintaining their cultivations well and generate a large income (Rs.12,000 per month) from the crop yield. The society plans on collecting Rs.400 per month from each home garden. This money will be used to support the other society members who did not get these benefits.

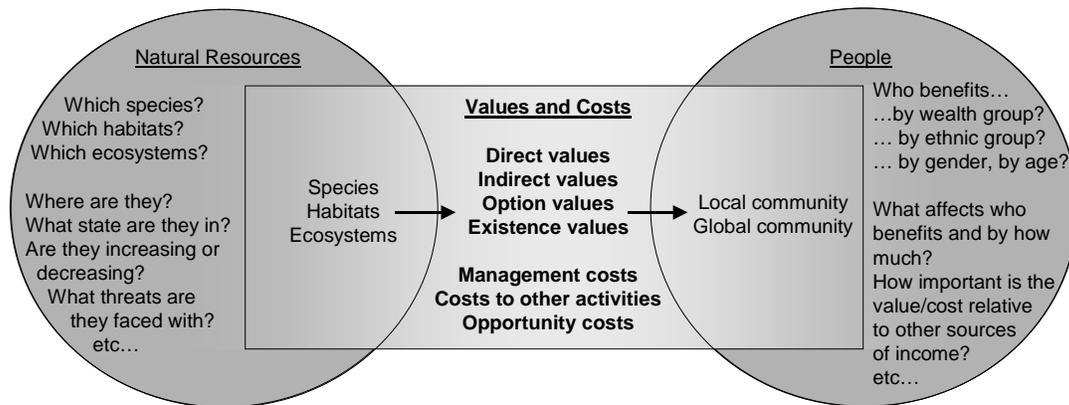
Different FCS have their own strategies to share the benefits from the project activities. However, some FCS have not instituted a benefits sharing mechanism with the communities. This highlights that some of the FCS do not have adequate capacity needed to design an effective benefit sharing mechanism. Therefore, there is a need to guide and build the capacity of the FCS which are involved in the implementation of BMZ activities to enable them to initiate a mechanism to share the benefits. The distribution of the benefits needs to be analyzed before designing a mechanism to share the project and natural resource benefits.

After the establishment of the proposed LMA, there will be a clear demarcation of rights for the management of the natural resources within the special management area. The creation of new forms of property rights (e.g. rights to fishing resources, rights to make decision on other natural resources conservation or sustainable use etc), may help in changing people's behaviour in ways that will reduce negative environmental impacts, share the benefits from natural resources among the communities and address poverty and equity issues. The LMA can make the necessary arrangements to put in place different forms of benefit sharing and cost sharing mechanisms. Some of these benefits can be directly translated into economic terms, while others are indirect benefits that cannot be easily quantified. The LMA will require the service of an expert who can identify the niches and needs for benefits and cost sharing.

Economic Valuation of Lagoon ecosystem services

Economic valuation seeks to demonstrate and quantify the value of the ecosystem services. This can estimate the value of supporting, provisioning, regulating and cultural services of the ecosystems using different methods. The use of integrated assessment methods can help in identifying species composition of the resources valued, distribution of services in different levels such as local, regional, national and global, separate out who receives which benefits and who bears the cost and how much. In some cases, such as the implementation of a special conservation management plan a cost may be incurred by some of the people due to the activities conducted by the project. This may result in increasing the cost for one part of the community and increasing the benefits for a totally different part of the community as a result of the project activities. Disaggregating the biodiversity and livelihoods information is a way to clearly identify the conservation values their distribution which may be locally, regionally, nationally or globally and identify the persons who will be better or worse off due the project activities.

The following figure shows the method in which the valuation exercise should be carried out to generate require information for decision making on benefits sharing. This is a simple way to identify the needs and niches.

Figure 5: Disaggregating natural resources and their beneficiaries in economic valuations⁸⁵

Source: ---- 2008

Benefits and cost needs should be disaggregated based on the classifications shown in the above diagram and identify those who bear more cost than the benefits and those who obtain more benefits with little or no cost. This exercise is the key to identify the needs and niches for benefits sharing.

6. Conclusion and Recommendations

Puttalam lagoon and its ecosystems are very important in terms of biodiversity and the livelihoods of the vulnerable and poor people including the refugees living in the area. The lagoon has unique ecological characteristics and provides provisioning, supporting, regulating and cultural services which are used by a number of commercial industries such as salt production and shrimp production etc. The lagoon ecosystems have been degraded as a result of unsustainable exploitation and the conversion of land for alternative uses and threats making it vulnerable.

There is an immediate need to take steps to reduce the pressure on lagoon ecosystems and address the threats faced by the lagoon and surrounding ecosystems such as mangroves, sea grasses, salt marshes and mudflats etc. This can't be done only by the line agencies which are responsible for lagoon and terrestrial resources, management; and the communities around the lagoon who are depending on the lagoon for their livelihood. The line agencies are suffering from lack of expertise and staff, resources, infrastructure and financial resources to plan and implement activities to promote conservation management of the Puttalam lagoon. The communities depending on the lagoon resources are poor, vulnerable and have very low capacity due to low human development and are unable to undertake sustainable resources extraction. With the population influx, lack of alternative income sources, low education and an increase in social issues they do not have any other option except exploitation of natural resources to earn their living.

There are a number of policies and laws to support sustainable resource use but due to various reasons they are not fully implemented in the area. Natural resource conservation and management is not a priority in this region, as the attention of the government and other agencies are directed towards more pressing issues such as inability to access the basic needs for the poor population, poor infrastructure facilities, social issues etc., which are more attractive for the traditional government and other development oriented agencies. The government provides insignificant funding for the line agencies to

invest in natural resources conservation and management in Puttalam, and the only source of funding during the last several decades came from the international donors and conservation and national NGOs. But now due to the global economic crisis these funds have also declined dramatically.

The BMZ project was implemented in Puttalam lagoon area from 2007 to 2010 with the financial support of Federal Ministry for Economic Cooperation and Development of Germany. Under the project a large number of activities were conducted with the participation of the stakeholders. A conservation management plan was developed under this project with the aim of ensuring the sustainable management of the Puttalam lagoon and its surrounding ecosystems. The plan provides guidelines to undertake different activities which will contribute towards achieving the ultimate goal of conserving the valuable ecosystems in the project area. As mentioned earlier, in order to implement the plan smoothly, a sustainable provisioning of financial resources is necessary, and this strategy provided guidance on how to adopt methods of sustainable financing for conservation management activities.

Institutional arrangements to implement this strategy have been identified in this document. In the short term Fisheries Department District office in Puttalam and Fisheries Cooperative Societies can be involved to garner financial resources by implementing the sustainable financing strategy. After establishing the proposed LMA, in the long-term the LMA and 12 fisheries societies together can follow the strategy for the sustainable financing of activities mentioned in the PLCMP.

A rapid process is necessary to establish the LMA with the relevant authority to function. There are some policy and legal barriers that hinder the implementation of some of the sustainable financing options, for example due to current policies and laws, the revenue which is self generated by the department of fisheries cannot be reinvested in within the district as proposed. These policies should be amended and the laws should be revised in order to facilitate the functioning of the LMA as well as the implementation of PLCMP and sustainable financing strategy.

The PLCMP has provided guidelines to make the background by strengthening the stakeholders, to undertake the implementation of the PLCMP and sustainable financing strategy. At the initial phase soon after the BMZ project ends, there is a need to make linkages with the current projects being implemented and planned to be implemented in the BMZ project area. This will help in influencing the stakeholders to follow the PLCMP and priorities their interventions accordingly. Because this will help to continue the activities done by the BMZ project and support to establish the LMA.

This strategy has proposed financing options which require additional information and expertise prior to their design and implementation. For example, to implement PES, EFR and other benefit sharing mechanisms, an extensive amount of background work should be carried out, such as integrated socio-economic and livelihood assessment, assessment of the options for the EFR to set the correct prices and taxes, assessment to determine the correct fees, taxes for the lagoon resources users etc. It is recommended that such activities be undertaken before implementing the financing options mentioned above.

There is a vast potential to increase the self generated financial resources from the economic and livelihood activities which are in being implemented at the lagoon and surrounding ecosystem. In order to do that, necessary information need to be generated. Capacity and efficiency of the relevant stakeholders needs to be improved through capacity building programmes. In addition coordination and networking with the stakeholders is also an essential condition for the success of the initiative. It was identified that the lack of coordination with the stakeholders is a barrier to attain the goal of conservation management of the lagoon ecosystems. Based on that, it is recommended that strong linkages with the current and upcoming projects in the Puttalam lagoon area be made.

The FCS can be played a major role in resource management and in generating financial resources and sharing the benefits generated from the project activities as well as natural resources. Their long time working relationship with the members of the societies has a power to influence the resource users to manage their resources in a sustainable manner. Building the capacity of the FCS on fund raising and management, needs and opportunities of benefit sharing and undertaking conservation management activities is a must.

The feasibility of carrying out all the actions in the PLCMP and sustainable financing strategy depends greatly on the support given from the higher government authorities. Under the current set up, the possibility of this is limited. For example, it is very difficult to convince the policy makers to allocate more resources for the environmental sector, because of the lack of understanding on the return of such an investment; the importance of ecosystem services for economic activities and the GDP; the value of protecting biodiversity as a part of development infrastructure; and potential opportunities to raise revenues and reduce poverty by doing such investments. Providing necessary science based information and using the support of the stakeholders to influence the policy makers can be helped in successful and timely implementation of the plans.

The financing options described in this strategy may be able to generate a substantial amount of funding for the lagoon resources conservation and management. The key to success is to rely on the multiple revenue sources and not simply on one individual option. Many of the options described above need users to pay for their consumptive and non consumptive products, but due to the 'public goods' nature of the lagoon resources it is difficult to capture such benefits. The establishment of the LMA is one way of defining the property rights of the lagoon resources to eliminate barriers and to capture natural resources benefits for conservation management activities. Ensuring that the sustainable financing and benefits sharing measures are appropriate and sustainable is essential in this process. Not all of the potential sources of finance identified can be implemented in a practical sense. Some may need to be tailored to fit in with the real world ecological, institutional, socio-economic and cultural characteristics of the Puttalam lagoon area.

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Annexes

Annex I

Adopted from ADB-RETA, Legal, Institutional and Policy Reform Report

Organization of the Institutions, their mandate and their relevant Law

A.

Institution	Ministry	Principal Mandate relating to coastal and marine resources management	Relevant Legal Enactment
1. CCD	Ministry of Fisheries and Ocean Resources	Undertake surveys and research to describe the existing condition of the coastal zone, prepare and periodically update the Coastal Zone Management Plan, Regulate and control the development activities within the coastal zone through permit procedure and the formulation and execution of work for coast protection and conservation.	Coast Conservation Act No: 57 of 1981 amended by Act 64 of 1988
2. DFAR	Ministry of Fisheries and Ocean Resources	Preparation of a plan for the management, regulation, conservation and development of fisheries and aquatic resources; licensing of fishing operations and registration of fishing vessels, protection of fish and aquatic resources, conservation.	Fisheries and Aquatic Resources Act No.2 of 1996 and regulations made there under.
3. NARA	Ministry of Fisheries and Ocean Resources	The promotion and conduct of research activities in the identification, assessment and development of aquatic resources and the development, management and conservation of aquatic resources in inland waters, coastal wetlands and offshore areas among others.	National Aquatic Resources Research and Development Agency Act 54 of 1981
4. CFHC	Ministry of Fisheries and Ocean Resources	Planning, designing, construction, establishment and management of fishery harbours and anchorages, marine structures and other shore facilities	Order of Incorporation Under the State Industrial Corporations Act
5. MPPA	Ministry of Fisheries and Ocean Resources	Safeguard and preserve the territorial waters of Sri Lanka from pollution arising from any ship based activities or shore based maritime related activities.	Marine Pollution Prevention Act No: 59 of 1981
6. NAQDA	Ministry of Fisheries and Ocean Resources	To develop aquatic resources and aquaculture (which includes coastal aquaculture, sea farming and brackish water fisheries)	National Aquaculture Development Authority Act 53 of 1998.

B.

Institution	Ministry	Principal Mandate relating to coastal and marine resources management	Relevant Legal Enactment
1. Central Environment Authority	Ministry of Environment & Natural Resources	Has wide powers for the protection of environment in the entire country and as such all these provisions apply to the coastal and marine areas and resources found therein. Sections 18 and 19 directly concern fisheries, and section 23 concerning discharge of waste and the regulations regarding EIA of development projects are of special concern to coastal and marine resources.	National Environment Act No 47 of 1980 amended by Act No 56 of 1988
2. Department of Wild Life Conservation	Ministry of Environment & Natural Resources	Declaration of any area of state land as a national reserve/marine reserve/sanctuary; regulation of series activities on the fringes of a sanctuary (several of which abut the coastal zone).	Fauna and Flora Protection Ordinance as bounded by Act No. 49 of 1993
3. Forest Department	Ministry of Environment & Natural Resources	Declaration of any area of state land or forest as a reserved forest within which certain acts are not permitted	Forest Ordinance amended by Act Nos. 13 of 1982, 84 of 1988, 23 of 1995
4. Sri Lanka Geological Survey and Mines Bureau	Ministry of Environment & Natural Resources	Issues licenses to explore or mine minerals	Mines and Minerals Act No. 33 of 1992

C.

Institution	Ministry	Principal Mandate relating to coastal and marine resources management	Relevant Legal Enactment
1. Ceylon Tourist Board	Ministry of Tourism	It is the duty of the Board to establish, regulate supervise and develop tourist resorts in the country the bulk of which are located within the coastal areas.	Tourist Development Act 14 of 1968
2. Department of Archaeology	Ministry of Cultural Affairs	Provides for conservation of sites of historical and archaeological value and interest many of which are found within the coastal areas.	Antiquities Ordinance
3. Urban Development Authority	Ministry of Plantation Infrastructure and Construction	Declaration of areas as development areas, responsibility for the physical planning of the area, issue of development permits	Urban Development Law amended by Act Nos 44 of 1984, of 1987, 41 of 1988
4. Sri Lanka Land Reclamation and Development Corporation	SLRDC, under the Ministry of Plantation Infrastructure, Construction)	Reclamation of low lying marsh, waste or swamps.	Low Lying Land Reclamation Act 52 of 1982
5. Board of Investment	(BOI, Min. of Industries)	Approval and regulation of investments	Board of Investments Act 49 of 1992
6. Department of Irrigation	Ministry of Irrigation & Water Management	Construction and maintenance of irrigation work including those in the coastal region	Irrigation Ordinance No. 32 of 1946
7. Ministry of PC & LG	Ministry of Provincial Councils & Local Government	Establishment of Provincial Councils provides for the devolution of powers and functions to the provinces	13 th amendment to the constitution

Bilateral Funds

Australian Agency for International Development (AUSAID)
Canadian International Development Agency (CIDA)
Danish International Development Agency (DANIDA)
Department for International Development (DFID)
EuropeAid
International Development Research Center (IDRC)
Japan International Cooperation Agency (JICA)
Netherlands Development Assistance (NEDA)
New Zealand's International Aid and Development Agency (NZAID)
Norwegian Agency for Development Cooperation (NORAD)
Swedish International and Development Cooperation Agency (SIDA)
Swiss Agency for Development Cooperation (SDC)
United States Agency for International Development (USAID)

Multilateral Funds

Consultative Group to Assist the Poorest (CGAP)
Development Marketplace
Global Environment Facility (GEF)
Post-Conflict Fund
World Bank
World Bank's NGO Capacity-building Funds
World Bank's Partnership for Capacity Building Program in Africa

Foundation Funds

Asia Foundation
Baxter International Foundation
Better World Together Foundation
Bill & Melinda Gates Foundation
Charles Stewart Mott Foundation
Conservation, Food and Health Foundation
David and Barbara B. Hirschhorn Foundation
Ford Foundation
Foundation for Future
Global Greengrants Fund
Jacob and Hilda Blaustein Foundation
Joseph Rowntree Charitable Trust
King Baudouin Foundation
MacArthur Foundation
Mcknight Foundation
Monsanto Foundation
Packard Foundation
Peace and Development Fund
Rockefeller Brothers Fund
Rockefeller Foundation
Toyota Foundation

Non Governmental Organizations

Action Aid International
Asia Foundation - Sri Lanka
Care International Sri Lanka
Care of the Nature
Lanka Jatika Sarvodaya Shramadana Sangamaya

Oxfam Australia
OXFAM GB
Puttalam District Consortium
Rural Development Foundation
Save the Children Sri Lanka
SEWA LANKA Foundation
The Australian Council for Overseas Aid - Sri Lanka
World University Service of Canada
World Vision Lanka



Ecosystems and Livelihoods Group, Asia

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