



Prepared by the

**Hikkaduwa Special Area Management and
Marine Sanctuary Coordinating Committee**

with support from

Coast Conservation Department,
National Aquatic Resources Agency,
Department of Wildlife Conservation

and sponsored by the

Coastal Resources Management Project

**of the Ministry of Transport, Environment & Women's Affairs of the
Government of Sri Lanka implemented by the University of Rhode Island with
financial assistance from the United States Agency for International Development**

**SPECIAL AREA MANAGEMENT PLAN FOR
HIKKADUWA MARINE SANCTUARY AND ENVIRONS,
SRI LANKA**

**Hikkaduwa Special Area Management and
Marine Sanctuary Coordinating Committee**

Divisional Secretariat
Pradeshiya Sabha
Coast Conservation Department
Department of Wildlife Conservation
National Aquatic Resources Agency
Ceylon Tourist Board
Department of Fisheries and Aquatic Resources Development
Central Environmental Authority
Urban Development Authority
Tourist Board Approved Hoteliers of Hikkaduwa
Hikkaduwa Small Hoteliers and Restaurateurs Association
Hikkaduwa Glass-Bottom Boat Owners' Association
Hikkaduwa Fisheries Cooperative Society

1996

Coastal Resources Management Project of the
Ministry of Transport, Environment & Women's Affairs of the Government of
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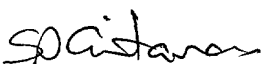
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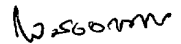
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HIKKADUWA SANCTUARY AND ENVIRONS, SRI LANKA**


as Approved for Implementation by the members of the
**Hikkaduwa Special Area Management/
Marine Sanctuary Coordinating Committee**
in May, 1996




Divisional Secretary, Hikkaduwa Division




Chairman, Hikkaduwa Pradeshiya Sabha



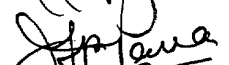
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Director General, Ceylon Tourist Board



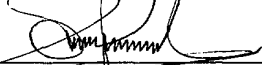
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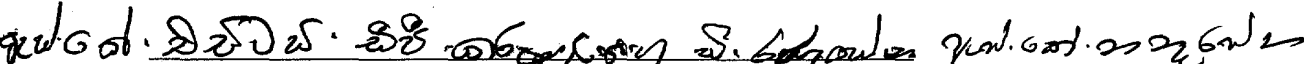
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Contents

List of Tables	vi
List of Figures	vii
List of Acronyms and Abbreviations	viii
Acknowledgments	x
Foreword	xi
Chapter 1. Background, Process, Goal and Objectives	1
1.1 Introduction to Hikkaduwa	1
1.2 Coastal Zone Management in Sri Lanka	2
1.3 The Special Area Management Approach and Planning Process	3
1.4 The Hikkaduwa Special Area Management Planning Area	4
1.5 Management Issues of Hikkaduwa	5
1.6 Goal and Objectives of the Management Plan	10
1.7 Justification for Management	11
1.8 Plan Implementation and Organization	13
Chapter 2. Management of Hikkaduwa Marine Sanctuary	15
2.1 Introduction	15
2.2 Problems and Issues of Sanctuary Management	15
2.3 Objectives and Policies for Sanctuary Management	18
2.4 Strategies and Actions for Sanctuary Management	19
Chapter 3. Management of Water Quality and Waste Disposal	29
3.1 Introduction	29
3.2 Problems and Issues of Pollution	30
3.3 Objectives and Policies for Management	32
3.4 Strategies and Actions for Implementation	33
Chapter 4. Shoreline Development, Infrastructure and Environmental Improvements	37
4.1 Background	37
4.2 Problems and Issues	38
4.3 Objectives and Policies for Management	39
4.4 Strategies and Actions for Implementation	40

Chapter 5. Tourism Development and Livelihood Opportunities	43
5.1 Background	43
5.2 Problems and Issues	44
5.3 Objectives and Policies for Management	45
5.4 Strategies and Actions for Implementation	46
Chapter 6. Plan Implementation	49
6.1 Institutional Framework	49
6.2 Summary of Objectives, Strategies and Actions	55
6.3 Implementation Time-frame, Rationale and Funding	56
6.4 Summary	56
Summary in Sinhala	65
References	77

List of Tables

1.1	Extent and condition of coastal resources of management concern	5
1.2	Management issues of the Hikkaduwa special area management site	10
6.1	Summary of objectives, strategies and actions for implementation of the Hikkaduwa Special Area Management Plan	59
	a. Sanctuary management	
	b. Management of water quality and waste disposal	
	c. Shoreline development, infrastructure and environmental improvements	
	d. Tourism development and livelihood opportunities	
6.1	Sinhala translation of Table 6.1	71

List of Figures

1.1	Boundaries of Hikkaduwa special area management site, Grama Niladhari divisions and the marine sanctuary	6
1.2	Hikkaduwa Marine Sanctuary boundaries	7
1.3	Overall land use and resource distribution in Hikkaduwa Special Area Management area highlighting beaches, water bodies, urban centers, tourism and agricultural uses	8
1.4	Projected revenues from poor and proper management of the Hikkaduwa coastal resources	12
1.5	Cumulative socioeconomic net present value for 3, 6, and 9 percent tourism growth rates	13
2.1	Zonation of Hikkaduwa Marine Sanctuary as proposed by De Silva and Rajasuriya in 1985	22
6.1	Institutional framework for planning and implementing the Hikkaduwa Special Area Management Plan	50
6.2	Management inputs, strategies and expected results for the Hikkaduwa special area management planning process	52

List of Acronyms and Abbreviations

ADB	Asian Development Bank
ATBAHH	Association of Tourist Board Approved Hoteliers of Hikkaduwa
CCD	Coast Conservation Department
CEA	Central Environmental Authority
CRC	Coastal Resources Center
CRM	Coastal Resources Management
CRMP	Coastal Resources Management Project
CTB	Ceylon Tourist Board
CU	Colombo University
CZMP	Coastal Zone Management Plan
DFARD	Department of Fisheries and Aquatic Resources Development
DFEO	Department of Fisheries Extension Officer
DS	Divisional Secretariat
DWLC	Department of Wildlife Conservation
FCS	Fisheries Cooperative Society
GEF	Global Environment Fund
GBB	Glass-bottom Boats
GBBOA	Glass-Bottom Boat Owners' Association
GN	Grama Niladhari
ha	hectare
HC	Ceylon Fishery Harbours Corporation
HM	Harbor Master
HSAM/MSCC	Hikkaduwa Special Area Management/Marine Sanctuary Coordinating Committee
HSHRA	Hikkaduwa Small Hoteliers and Restaurant Association
km	kilometer
LHI	Lanka Hydraulic Institute Ltd.
mm	millimeters
MEIP	Metropolitan Environmental Improvement Project
MFARD	Ministry of Fisheries and Aquatic Resources Development
MOH	Medical Officer, Ministry of Health
MPPI	Ministry of Policy Planning and Implementation
MTEWA	Ministry of Transport, Environment and Women's Affairs
NARA	National Aquatic Resources Agency
NAREPP	Natural Resources and Environmental Policy Project
NGO	Nongovernmental organization
NWSDB	National Water Supply and Drainage Board
OIC	Officer in charge, Hikkaduwa Police

List of Acronyms and Abbreviations

PD	Police Department
PS	Pradeshiya Sabha
RDA	Road Development Authority
Rs	Rupees
SAM	Special Area Management
spp	species
UDA	Urban Development Authority
URI	University of Rhode Island
USAID	United States Agency for International Development

Acknowledgments

This Management Plan represents the combined work, discussion, thinking and action of numerous individuals, government and nongovernmental agencies and organizations. Most of all, it is the product of the Hikkaduwa Special Area Management/ Marine Sanctuary Coordinating Committee chaired by the Divisional Secretariat and comprised of all the members listed in the Plan. Special thanks are due the technical consultants listed below who assisted at various times in the planning process. The continued support of the Coast Conservation Department, the National Aquatic Resources Agency, the Department of Wildlife Conservation and that of the Coastal Resources Management Project of the Natural Resources and Environmental Policy Project, United States Agency for International Development made the plan possible.

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The many others in Hikkaduwa and elsewhere who contributed to this plan are gratefully thanked for their assistance. The Hikkaduwa Special Area Management/Marine Sanctuary Coordinating Committee assumes the ultimate responsibility of the plan contents.

Foreword

The Hikkaduwa Marine Sanctuary is endowed with a beautiful near-shore coral reef that shelters a small lagoon and beach in southern Sri Lanka. The reef provides habitat for colorful fish and protects beaches from the erosive forces of the open ocean. The Sanctuary is also the center for a tourism economy that contributes millions of rupees annually to the local and national economy. Thousands of people depend upon the Sanctuary and the adjacent coast for employment in tourism and fishing. Others depend upon the coastal area as a convenient waste sink or an accessible source of materials such as coral, limestone, sand or wood. But, as with all natural systems, there are limits to the impacts and extraction levels that can be absorbed.

In Hikkaduwa, uncontrolled tourism development threatens to undermine the resource base that makes Hikkaduwa attractive. Consequently, we need this Special Area Management Plan to guide the use of these resources. Without such a plan, the potential grows daily for destruction of the coastal resources and loss of their valuable long-term benefits.

This “Special Area Management Plan” focuses on managing the resource user conflicts of the Hikkaduwa Marine Sanctuary and its environs. It is an integrated plan which addresses all the important management issues. It defines management roles for local communities, local government, national government agencies and non-government organizations--both local and national. This comprehensive plan sets the direction of action for sustainable development of the Hikkaduwa resources and area. Most important, the plan represents the perspectives and needs of the active stakeholders in the Hikkaduwa planning area. The stakeholders, comprised of government and community groups, are working together in a collaborative effort for management of resources in the area.

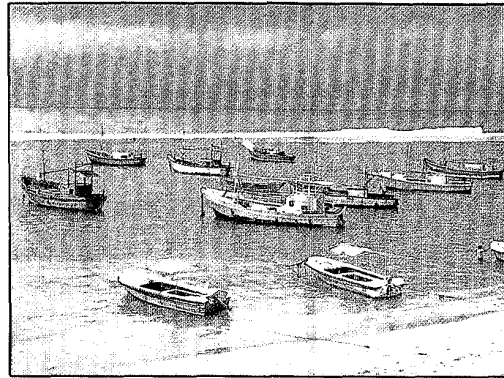
This plan can guide us towards sustainable development of the Hikkaduwa area and its rich environment. If we ignore the pending threat of loss and destruction of coastal resources, the cost of reparation will only accumulate and fall on the next generation. Let us act now and implement the Special Area Management Plan for Hikkaduwa.

Director
Coast Conservation Department

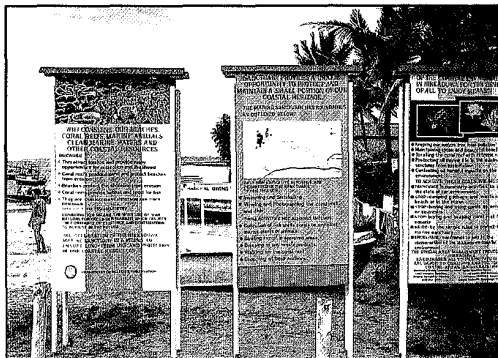
MAJOR ISSUES AND OPPORTUNITIES IN HIKKADUWA



People walking on the reef and breaking the corals require continuous education and surveillance



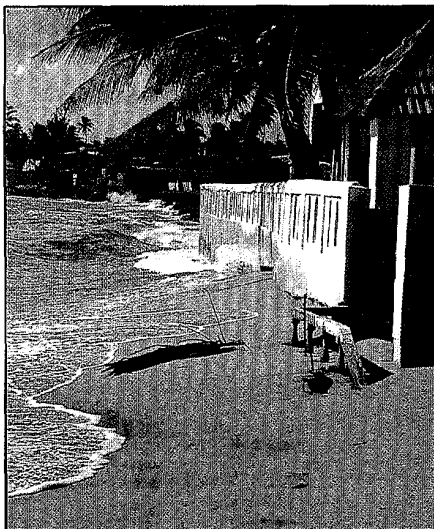
Anchored fishing boats breaking the corals in the Sanctuary will be relocated to the boat harbour



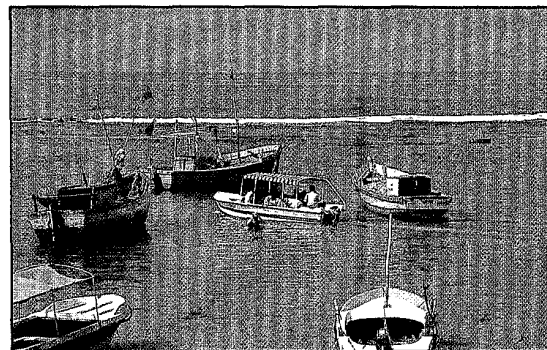
Various signs to educate residents and tourists about the Sanctuary



Fish landing on Sanctuary beach conflicts with tourist use



Barrier walls without setbacks are no longer permitted.



Glass-bottom boats in Sanctuary must be careful to protect the reef

Chapter 1

BACKGROUND, PROCESS, GOAL AND OBJECTIVES

1.1 Introduction to Hikkaduwa

Hikkaduwa is a picturesque seaside fishing community located in Galle District of Sri Lanka, approximately 100 kilometers south of Colombo. Over the last 25 years, Hikkaduwa has developed into the most popular beach resort area in the country. Annually, thousands of tourists are attracted by the sandy beaches, coral reefs and their brightly colored fish. Hikkaduwa is also home to the country's first marine sanctuary, established in 1979.

In Hikkaduwa, as well as in other coastal areas of Sri Lanka, tourism has supplanted fishing as the most important economic activity. Tourists spent more than 300,000 guest nights in Hikkaduwa in 1992 and contributed more than Rs 109 million in net direct benefits to the economy¹⁶. The indirect benefits add more than Rs 900 million. Together this has provided an economic base that ultimately provides local employment for more than 3500 persons.

Unfortunately, the many benefits of tourism also produce negative impacts and environmental costs for the community. Some of these problems include the degradation of the coral reef ecosystem, deteriorating coastal water quality, increasing traffic congestion and noise, and conflicts between tourist and fishing interests. Social problems include incidences of drug abuse and prostitution. The situation has declined to where these problems threaten to undermine the attraction of Hikkaduwa for tourism.

In an effort to combat Hikkaduwa's problems, this Special Area Management (SAM) Plan has been designed by the citizens of Hikkaduwa along with input from numerous government agencies. The goal is to ensure the sustainable management of Hikkaduwa's coastal resources. This plan provides a brief description of Hikkaduwa and a justification for developing a management plan. A more detailed information base on Hikkaduwa can be found in *The Coastal Environmental Profile of Hikkaduwa, Sri Lanka*.¹¹

The SAM Plan is a "living document" that is flexible and adaptable enough to meet the current needs of the community as it evolves. It addresses major problems chapter by chapter and presents policies, strategies and actions

1 Background, Process, Goal and Objectives

which have been recognized during public meetings as solutions for the problems. The local entity which coordinates the development and implementation of the SAM Plan is the Hikkaduwa Special Area Management/Marine Sanctuary Coordinating Committee (HSAM/MSCC). The plan also can serve as a model to assist persons working in other similar situations along the coast of Sri Lanka.

1.2 Coastal Zone Management in Sri Lanka

Coastal areas are the most socially and economically important areas of Sri Lanka. Over one-third of the population and two-thirds of the urbanized land are located in the coastal region, as are 80 percent of the tourism-related infrastructure and factories which account for two-thirds of the country's industrial production.¹² As the economy continues to grow with a special emphasis on industrial and tourism development, the coastal areas will increase in importance.¹

In general, however, development activities in coastal areas of Sri Lanka have lacked proper planning and management. Over the years, as the intensity of activities has increased, the result has been a number of environmental and social problems. Common problems are pollution, coral and sand-mining, overfishing, felling of mangroves, filling of wetlands and loss of biological diversity.

The Government of Sri Lanka recognized the need for more comprehensive and integrated coastal resource management and responded by enacting the Coast Conservation Act in 1981. Key aspects of the Act required the Coast Conservation Department (CCD) to develop a Coastal Zone Management Plan (CZMP), regulate and control development activities within the coastal zone (the area 2 km out to sea, 300 m inland, and 2 km inland for rivers and estuaries), and design and implement coast conservation projects.^{4,5} The CZMP, as approved in 1990 and 1996, recognizes the need to devolve resource management responsibilities to local government authorities and NGOs. This is supported by the policies of *Coastal 2000: Recommendations for a Resource Management Strategy for Sri Lanka's Coastal Region*,¹² which strongly advocates participatory resource management by governmental and nongovernmental agency collaboration.

The implementation of locally-based, geographically specific, Special Area Management (SAM) plans involves the affected communities and provincial agencies in the process of resource management. Such plans build community-level support through a highly participatory process and create community-based management groups.¹⁸ The Hikkaduwa SAM process, started in 1992, is responsible for the development of this management plan.

1.3 The Special Area Management Approach and Planning Process

Top-down planning and implementing mechanisms often fail from a lack of support and commitment within local communities. In contrast, SAM planning actively encourages the local community groups to participate as principal stakeholders with local and central government agencies in planning and implementation. The local community gains a sense of “ownership” of the planning process and helps focus actions to address the most pressing issues. Also, by taking a lead role in planning and management, community groups and local government can ensure that they share tangible benefits from plan implementation. This is the main incentive for community groups to participate and helps to ensure that activities are continued in the future.

The role of the Coast Conservation Department and the Coastal Resource Management Project in the SAM process is that of a catalyst and facilitator. This is accomplished by providing technical and financial assistance and by helping to mediate competing demands so that the resource use is both fair and sustainable. Most importantly, it strengthens the planning and management capabilities of community groups and local government so they can gradually assume responsibility for SAM implementation.

In Hikkaduwa, the overall planning process is coordinated by the Hikkaduwa Special Area Management/Marine Sanctuary Coordinating Committee (HSAM/MSCC), which is made up of representatives from various government agencies and community groups. The most important of these are the Department of Wildlife Conservation (DWLC), CCD, the National Aquatic Resources Agency (NARA), the Ceylon Tourist Board (CTB), the Urban Development Authority (UDA), the Divisional Secretariat (DS) and the Pradeshiya Sabha (PS) Hikkaduwa, the Association of Tourist Board Approved Hoteliers of Hikkaduwa (ATBAHH), the Hikkaduwa Glass-bottom Boat Owners Association (GBBOA), the Hikkaduwa Fisheries Cooperative Society (FCS) and the Hikkaduwa Small Hoteliers and Restaurateurs Association (HSHRA).

The SAM approach is a dynamic, collaborative process involving a number of overlapping steps. The planning process is flexible and ongoing. The basic plan is developed early, but as circumstances change, the plan is adapted as necessary. Another key aspect of the SAM approach is that even during planning, implementation of preliminary, small action projects can proceed. Such preliminary implementation provides incentive for community groups to participate and assume responsibility for future implementation.

Box 1.1 History of Hikkaduwa Special Area Management and Marine Sanctuary Coordination Committee

The HSAM/MSCC began in 1992 as the Hikkaduwa Marine Sanctuary Development Committee under the chairmanship of the Minister of Tourism and Rural Industrial Development. Although the sanctuary is located in the coastal region, DWLC assumed responsibility to coordinate the early SAM process for Hikkaduwa. The Director, DWLC, as co-chairman, initially focused the SAM process only on the sanctuary.

Since 1992, the committee chairmanship has changed several times although many original members have consistently sustained the process. In 1995, committee leadership shifted from the national level to a local institution. The Divisional Secretary has taken a very active role as chairperson of the committee.

The HSAM/MSCC held nine formal public meetings in 1995. As public awareness and participation increased, concern was raised about issues affecting not only the sanctuary but also the community as a whole. Consequently the SAM Plan has broadened beyond the boundaries of the sanctuary and traditional law enforcement to include town infrastructure, coastal aesthetics, traffic control, unemployment and social problems.

1.4 Hikkaduwa Special Area Management Planning Area

The SAM activities in Hikkaduwa are focused on the marine sanctuary (designated in 1979) and the area immediately outside of the sanctuary (Figure 1.1). The sanctuary includes the most extensive coral reefs in the area and is situated between the Fisheries Harbor groin to the north, the Coral Gardens Hotel to the south and out to the Rocky Islets seaward (Figure 1.2). It is in this core area where most of the tourist establishments and activities are located. The extent of coastal resources in the SAM area is summarized in Table 1.1.

The HSAM/MSCC also recognizes that impacts upon the sanctuary core often originate from outside its boundaries and even from outside of the “coastal zone”. Therefore, a number of projects and activities are proposed to address some of these “external” problems.⁴

Table 1.1 Extent and condition of coastal resources of management concern

Coastal Resource	Area (ha)	Diversity	Condition
Beaches	14	NA	narrow /dynamic
Water quality	reef area	NA	generally good*
Corals	25 (approx)	60 spp 31 genera	degraded
Reef fish	reef area	168 spp 76 genera	diverse/tame
Coastal strip	38.4	NA	narrow /crowded
Marine Sanctuary	45	fish, corals, sand	small/dynamic

NA Not Applicable

* Described in *The Coastal Environmental Profile of Hikkaduwa*¹¹

The limited geographic scope of the Hikkaduwa SAM planning area is comprised of the sanctuary (45 ha) and 13 Grama Niladhari (GN) Divisions (1020 ha), from Totagamuwa in the north to Patuwatha in the south. The population of the largely urban area in 1990 was 13,815 with about 3,424 people per km².

Land ownership and use are generally restricted to small parcels (Figure 1.3). Urban uses occur on 406 hectares (39.8%) of the total SAM area. Coconut plantation accounts for 360 ha (35.3%) and mixed crops cover 180 ha (17.6%).

Hikkaduwa is located in the wet zone and has an annual rainfall averaging just over 2,000 mm. There are two rainy seasons, the southwest monsoon from mid-April to mid-June, averaging 280 mm per month, and the northeast monsoon, from mid-September through November, averaging 255 mm per month. The windiest time of year generally coincides with the southwest monsoon. During the two monsoons, the high winds and rain make the water conditions generally unsuitable for viewing the reef or swimming in the lagoon. Therefore, the peak season for tourism is during the dry season from December through April when average monthly rainfall is only 75 mm and the wind is light.¹¹

1.5 Management Issues of Hikkaduwa

Meetings of the HSAM/MSCC and discussions with individual resource user groups have identified a number of key and persistent issues. Many issues and proposed solutions were initially raised by NARA

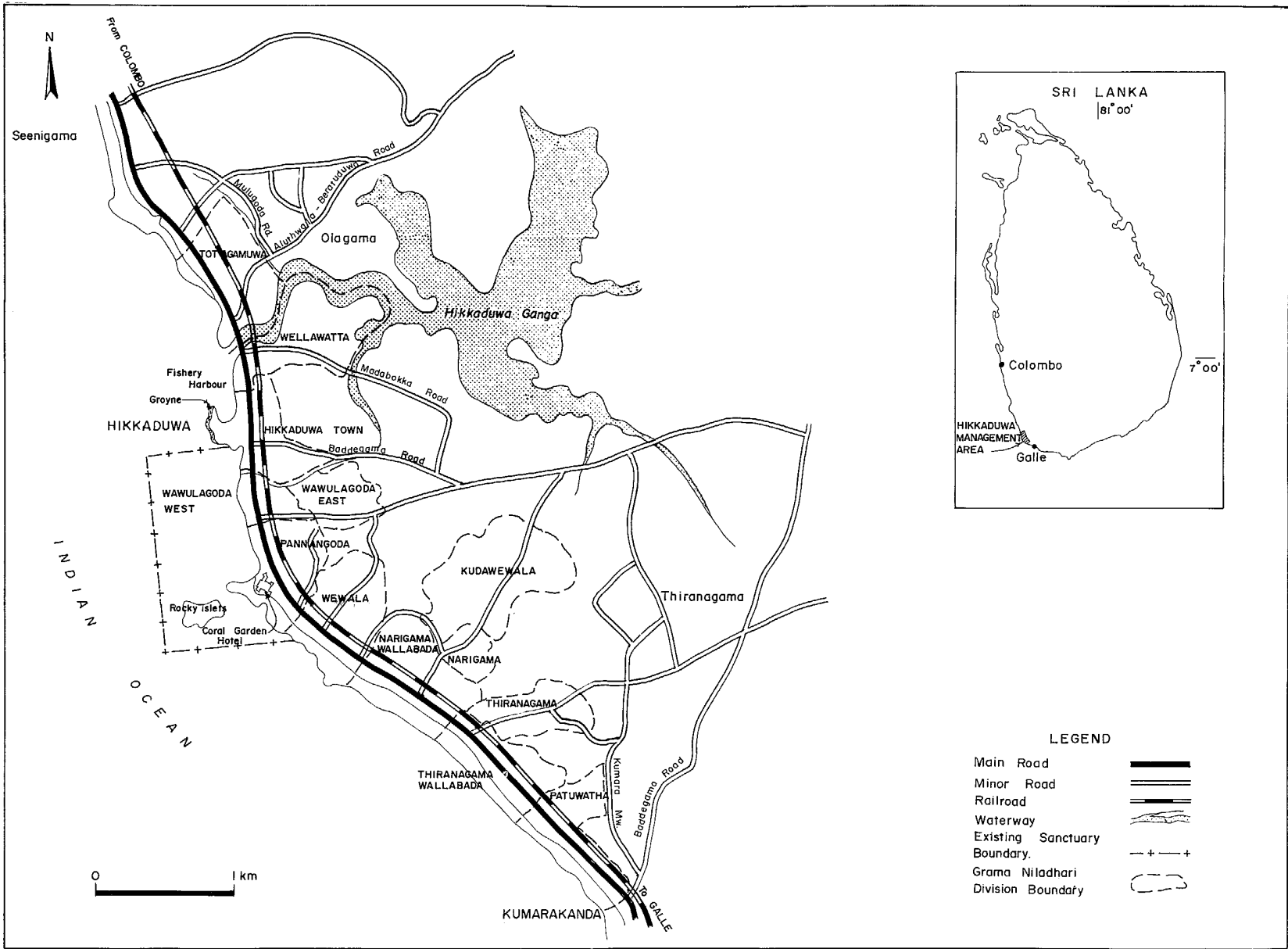


Figure 1.1 Boundaries of Hikkaduwa Special Area Management site, Grama Niladhari divisions and the Marine Sanctuary

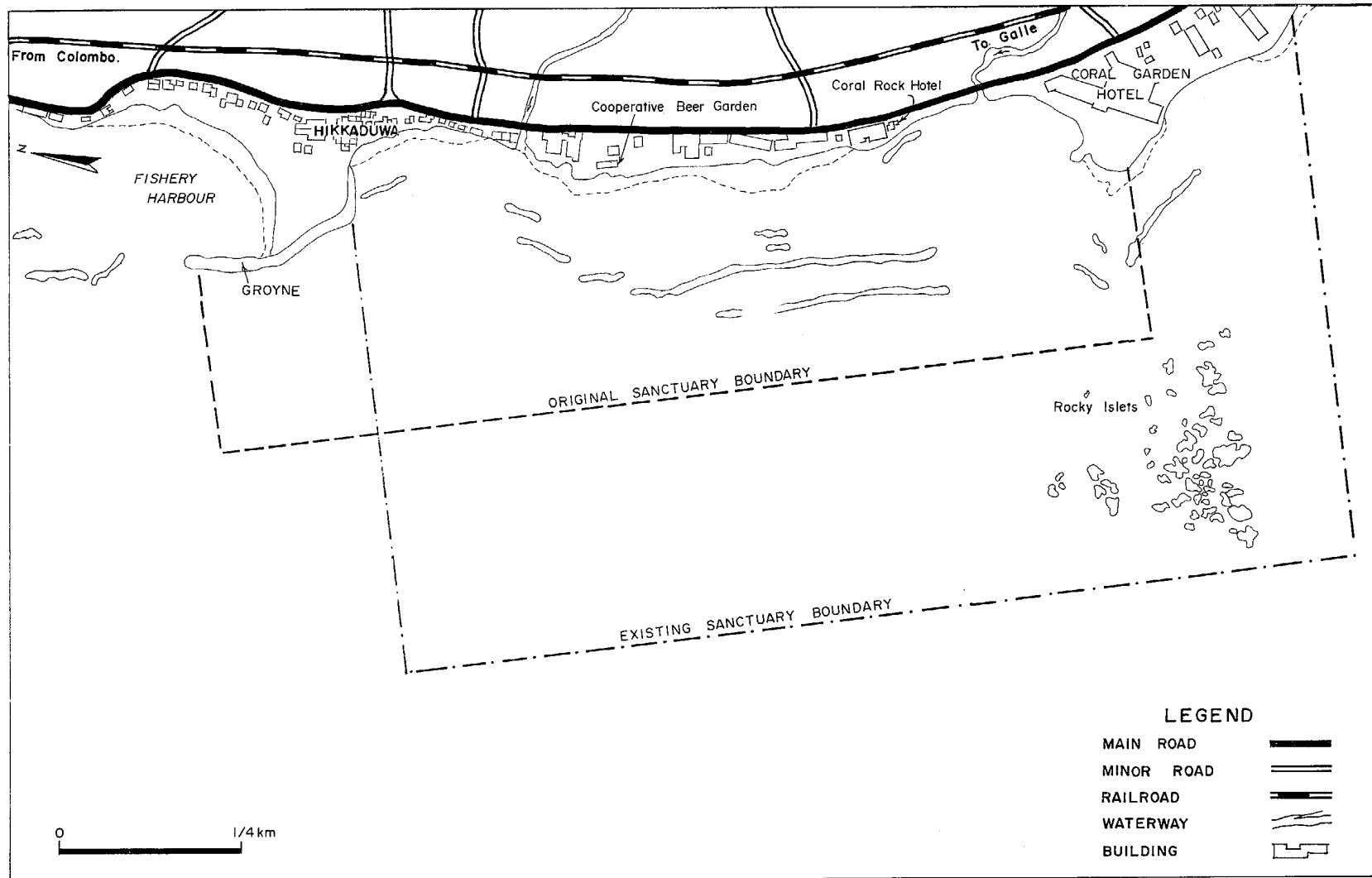


Figure 1.2 Hikkaduwa Marine Sanctuary boundaries

1 Background, Process, Goal and Objectives

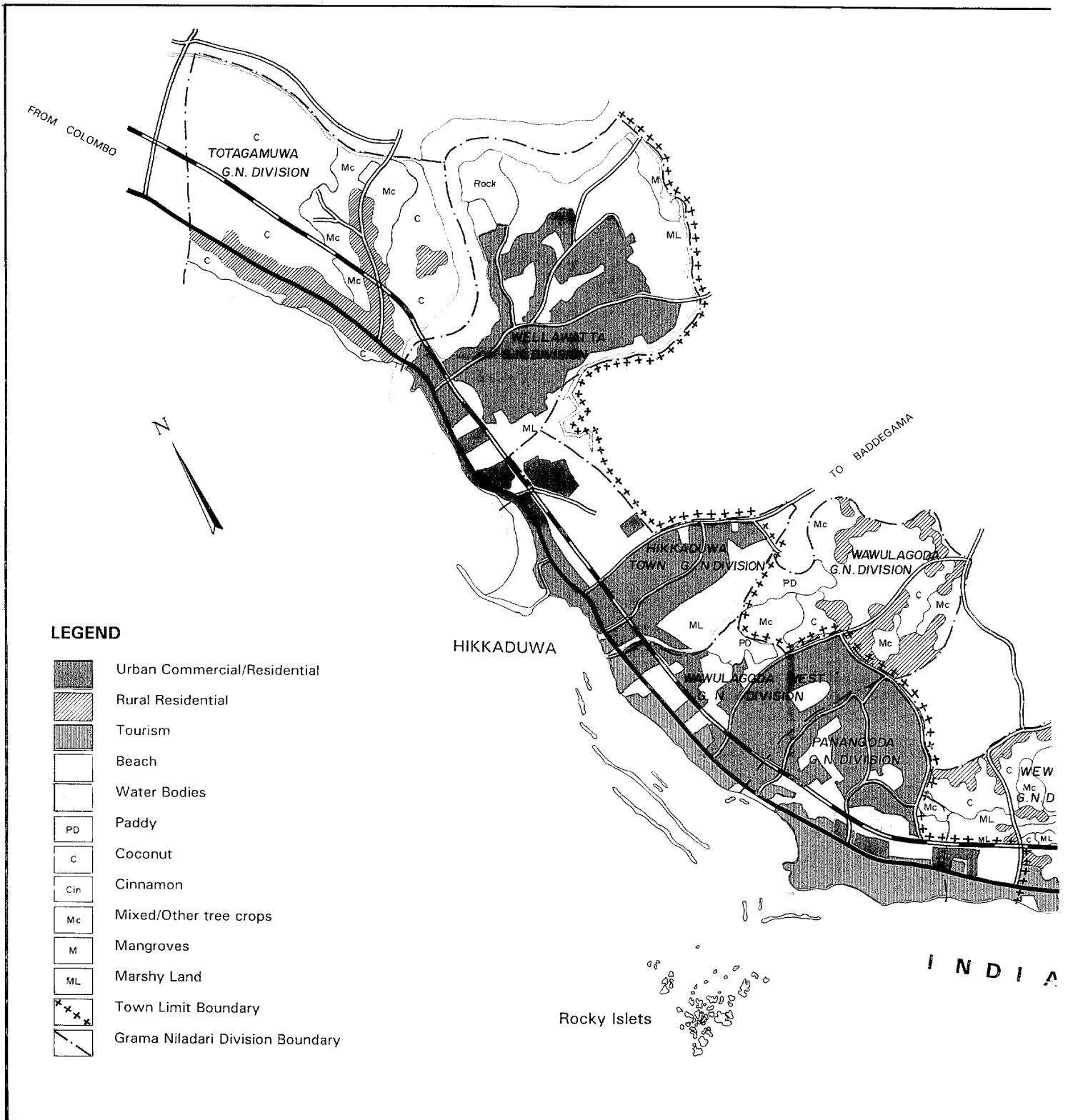


Figure 1.3 Overall land use and resource distribution in Hikkaduwa Special Area Management



CARTOGRAPHY : P. K. KANNANGARA

22 MAY 1994

area highlighting beaches, water bodies, urban centers, tourism and agricultural uses

1 Background, Process, Goal and Objectives

researchers, De Silva and Rajasuriya (1985), more than one decade ago. Most issues are interconnected and affect more than one group of stakeholders. For example, degradation of the coral reef in the sanctuary is linked to the lack of a suitable harbor that can accommodate all the fishing boats moored within the sanctuary. Though both are mentioned as separate issues, they have a common solution with benefits to many interest groups (tourism and fishing industry). The issues listed below in Table 1.2 are described more completely in The Coastal Environmental Profile of Hikkaduwa.¹¹

Table 1.2 Management issues of the Hikkaduwa Special Area Management Site

Hikkaduwa Marine Sanctuary Resources

- Degradation of coral reefs and marine life
- Inadequate anchorage and landing for fishing boats and poor access route into the harbor
- Poorly controlled and conflicting use of marine sanctuary

Water Quality and Waste Disposal

- Deteriorating coastal water quality
- Improper disposal of sewage and gray water into groundwater and coastal waters
- Inadequate solid waste disposal
- Insufficient fresh water supply

Shoreline and Community Character

- Excessive traffic speed, noise and congestion
- Increasing intensity of beach and sanctuary use
- Illegal construction on beaches and loss of public access

Impacts of Tourism and Need for Livelihood Opportunities

- Lack of alternative forms of income generation
 - Local informal tourism facilities do not work together
 - Aggressive touts intimidate visitors
 - A reputation for prostitution and drug use attracts undesirable activities
-

1.6 Goal and Objectives of the Management Plan

To address the issues described above the HSAM/MSCC supports the following goal of the Special Area Management Plan:

To protect and manage the coastal resources of Hikkaduwa so that the community can continue to benefit from their biodiversity and general environmental quality and that the local tourism and fishing economies can remain sustainable.

To achieve this goal, the HSAM/MSCC has adopted the following objectives as overall policies of this plan. These are to:

1. Improve the health of the ecosystems within and near the sanctuary by: reducing physical damage to the coral reef; improving coastal water quality; and, enhancing the populations of marine organisms;
2. Improve the capability of the local community to protect and manage the coastal resources in an integrated and sustainable manner by: increasing public awareness; ensuring community participation in planning; and, by developing institutional and legal support for SAM planning actions;
3. Increase the benefits at the local and national level by encouraging a viable local economy based on sustainable levels of tourism and fishing; and,
4. Enrich the general environmental quality of the community by making advances in waste disposal, water supply, transport infrastructure and land use planning.

1.7 Justification for Management

Numerous individuals and user groups are concerned about the issues and conflicts which justify active management of Hikkaduwa's natural resources and coastal industries. NARA and University researchers painstakingly document the status of biodiversity and reef quality in the heavily impacted sanctuary. Glass-bottom boat operators complain about too many boats in the sanctuary. Swimmers criticize the pollution coming from fishing boats and fear the hazards of passing boats. Fishermen shout that the sewage from coastal hotels is degrading water quality. Tourists are afraid to walk the streets because of aggressive touts and speeding traffic. Hoteliers moan because their European tour connections have dropped Hikkaduwa as a tour destination. Although the list goes on, user conflicts and diminishing biodiversity are not the only justifications for managing Hikkaduwa's environment. Severe economic impacts also may occur.

The tourism industry in Hikkaduwa generates substantial economic benefits through business profits, various jobs, and foreign exchange earnings. In 1992, the net direct economic benefit to the Hikkaduwa economy was Rs. 109 million which also generated indirect benefits of about Rs. 925 million¹⁶ for a total of Rs. 1036 million. The relationship between future tourism revenues and the environmental quality of Hikkaduwa has been portrayed in two models. One represents the present trend of no action and non-sustainable use. The second model incorporates improvements to infrastructure and proper resource management.

Figure 1.4
Projected revenues from poor and proper management of the Hikkaduwa coastal resources¹⁶

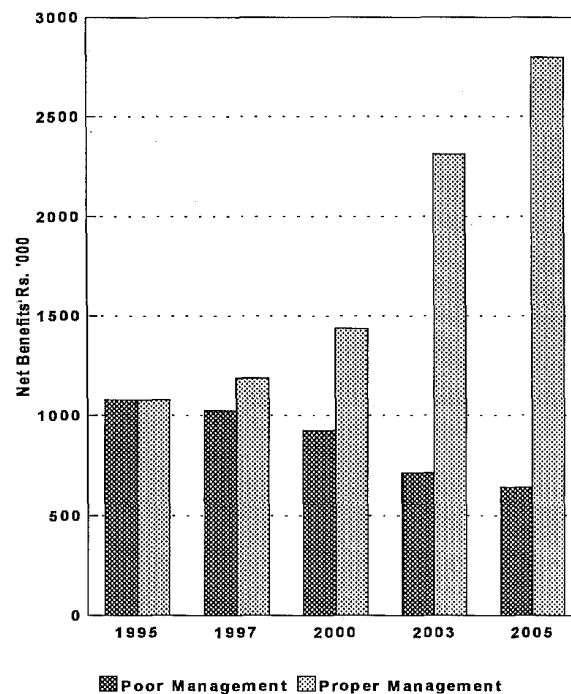


Figure 1.4 illustrates 1) poor management with declining numbers of tourists visiting the area and therefore decreasing tourism revenues over the next ten years; and, 2) that a solid investment in environmental management and protection beginning now is expected to promote increasing tourist visitation. The result is increasing total and net revenues for Hikkaduwa during the next ten years. This study concluded that the net benefits of improving environmental quality will far exceed the net benefits (or losses) of a no-action scenario.

Looking further, the net present value (NPV) of the total net benefits over 20 years has been calculated and compared after estimating different levels of tourism growth as shown in figure 1.5.¹⁹ In this analysis, after 3 years, even at the lowest levels of tourism growth, the combined costs for managing the marine sanctuary, maintaining clear marine waters, properly disposing of sewage and solid waste, and improving infrastructure such as the harbor, roads and walkways would more than pay for itself and provide increased revenues. The estimated cost of preventing environmental degradation is equal to only a small portion of the net economic benefits that would accrue to the area over the 20 year study period. The analysis also supports the concept of collecting a local donation or fee from tourists and a utility assessment from businesses to be reinvested in local coastal resources management.

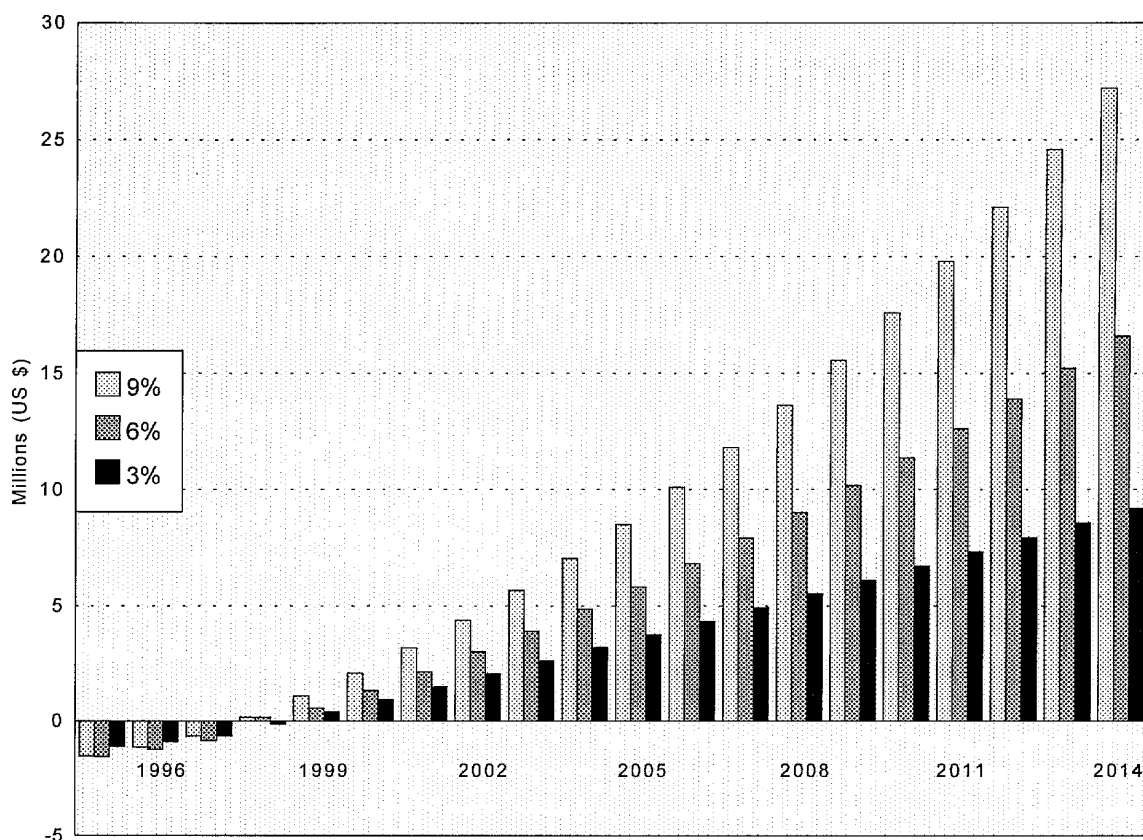


Figure 1.5 Cumulative socioeconomic Net Present Value for 3, 6 and 9 percent tourism growth rates¹⁹

Taken together, the existing user conflicts and the impending economic impacts provide considerable justification for developing and implementing a management plan for Hikkaduwa. Failure to assemble the support and cooperation of a community based plan can lead only to continued degradation of the natural resources and, eventually, the decline of the local economy. Fortunately, the local community organizations, government officials and private individuals of Hikkaduwa are willing to devote the time and energy necessary to develop and implement a management plan. It is these parties who have made a commitment to work together to determine the future of Hikkaduwa.

1.8 Plan Implementation and Organization

This Special Area Management Plan is a logical and simple document. The introduction includes relevant background information on the Hikkaduwa management site summarized from the *Coastal Environmental Profile of Hikkaduwa, Sri Lanka*.¹¹ Chapter 2 presents issues which affect the

Box 1.2 Recovering the costs of environmental management

The cost-benefit analysis of Hikkaduwa by White, Barker and Tantrigama demonstrates the good economic sense of investment in environmental management programs.¹⁹ To recover the cost of management, the study proposed that:

- All stakeholders involved in tourism activities such as hotels and restaurants, should be included in such a scheme;
- Taxation of tourism businesses will be resisted, thus it is preferable if management funds can be recovered as contributions or utility fees so that establishments can deduct them from their taxable income;
- Funds collected for environmental management should be retained locally by the town government without transferring to the national budget;
- Consumer surplus can be captured through an entrance fee to the sanctuary or donations solicited for specific uses; and
- National agencies with jurisdiction in Hikkaduwa should allocate budgets for activities under their responsibility in the SAM Plan.

Hikkaduwa Marine Sanctuary resources. Plans for managing solid and liquid waste generated in Hikkaduwa are discussed in Chapter 3. The proposed strategies, actions and projects relating to improvements to infrastructure and the general environment are found in Chapter 4. Chapter 5 addresses the impacts of tourism and examines opportunities for alternative livelihoods. Finally, chapter 6 explains how plan implementation will be coordinated and governed. Tables summarizing management objectives and strategies are also included.

Development guided through this SAM plan requires collaboration at the local level. Community groups, such as the glass bottom boat owners, hoteliers and restaurateurs, and fishermen must regularly meet with local government officials and the national agencies regulating activities occurring in Hikkaduwa. All parties must agree, in principle, on the many actions to be carried out under the plan and be willing to implement those activities which lie within their specific line responsibilities. The key to an environmentally sound and prosperous Hikkaduwa is the commitment and coordination of the various community and government stakeholders represented in the HSAM/MSCC.

MANAGEMENT OF HIKKADUWA MARINE SANCTUARY

2.1 Introduction

The Hikkaduwa Rocky Islets, together with the Ambalangoda Rocky Islets, were granted sanctuary status in 1940 under the Fauna and Flora Protection Ordinance only to protect nesting seabirds. Later, on 3 March 1961, the indiscriminate removal of fish at Hikkaduwa was prohibited under the Fisheries Ordinance for a 110 acre “Fisheries Protected Area” which included the coral reefs.

To consolidate the earlier efforts to provide protection to the area, the Hikkaduwa Marine Sanctuary was created by Gazette No. 37 of 18 May 1979 through the Fauna and Flora Protection Ordinance under the Department of Wildlife Conservation (DWLC). Designation of the sanctuary followed the same boundaries of the earlier “Fisheries Protected Area” but excluded the Rocky Islets. The intent was to protect the marine area from any exploitation or ecological damage except for traditional fishing by a limited number of permit holders.

Today, the area supports a wide variety of activities, many of which create conflicts among the different user groups. Despite the present sanctuary status, these conflicts are degrading the coral reef and water quality and jeopardizing the ecological resource base that makes Hikkaduwa attractive for tourism. Therefore, it is proposed to upgrade the sanctuary to Nature Reserve status. This provides sufficient legal support to restrict access as well as to control activities within the protected area. It also authorizes the department to collect permit fees to offset some operational costs for managing the sanctuary.

2.2 Problems and Issues of Sanctuary Management

Degradation of the Coral Reef

Effective coral reef management is the highest priority issue because the reefs support a diverse marine ecosystem which protects the shoreline from coastal erosion and also serves as the main tourist attraction in Hikkaduwa.

2 Management of Hikkaduwa Marine Sanctuary

Over the last 25 years, the quality of the coral reef has declined significantly. Within the reef lagoon, Rajasuriya (1994) found live hard coral cover to be only 34 percent with one transect as low as 13 percent near the boat anchorage area. Fishing boats, glass bottom boats and tourists are the major sources of coral reef damage within the sanctuary. Coral mining, the major cause of reef destruction in the past, is now prevented within the sanctuary due to strict enforcement. It still blatantly occurs outside the sanctuary to the north.

Changes in coral quality also affect coral fish populations. The quantity and variety of coral reef fish and other marine organisms has declined significantly over the years due to habitat destruction and the collection of reef fish for the aquarium trade.¹³ The result is a loss of biodiversity which also detracts from the tourist trade.

Damage associated with actual subsistence fishing in the sanctuary is not great. Less than 20 persons are licensed to fish the sanctuary using traditional methods of hook and line or small cast nets. For most, it constitutes part-time employment.

Glass-bottom Boat Operation

More than sixty glass-bottom boats (GBB) now provide visitors an opportunity to see the reef up close without swimming. During a busy weekend, twenty boats may operate simultaneously in the same small area of the sanctuary. These boats cause great damage as they operate in shallow water, run into and break coral branches. One accidental collision with the delicate coral can cause significant damage requiring years to regrow. The cumulative effects of many boat visits can substantially reduce the live coral cover of the reef and habitat for reef species.

Another conflict in use of the sanctuary is the large number of boats cruising in the same space where tourists are swimming and snorkeling. Boats are usually overloaded and operate in a manner endangering occupants and nearby swimmers and snorkelers. The mooring lines of the boats also extend up onto the beach and create a hazard for beach walkers. Ultimately this decreases the attractiveness of the area for tourism.

Needed regulations have been recommended by NARA, DWLC, and CCD but the glass bottom boats still operate without control. Although there is a limit of 50 boat permits given by the Pradeshya Sabha, numerous boats operate without licenses. The first step in controlling the activities of the GBB is to control access to the protected area. The present sanctuary status give protection to the corals but it does not control access by boats. Upgrading to the Nature Reserve status authorizes DWLC to directly limit the activities of commercial boats operating within the sanctuary.

The glass bottom boat owners and operators are aware of the damage they are causing and acknowledge the need to change their current practices. They have formed an organization, the Hikkaduwa Glass-Bottom Boat Owners Association (GBBOA), that represents many of the boats. Although some boats owned and operated by the larger hotels have chosen not to participate in this organization, the GBBOA recently was successful in setting uniform rates for boat rental.

Fishing Boat Anchorage in Sanctuary

Except for traditional forms of fishing, it is illegal to fish or anchor within the sanctuary. Most fishing boats anchor north of the sanctuary behind a groin constructed by the Irrigation Department in 1960. The groin's original purpose was to prevent sand bar formation at the mouth of the Hikkaduwa Lagoon and River but local fishermen began using the protected waters behind it as an informal boat harbor. Since siltation has reduced its mooring capacity over the years, 30 vessels now regularly use the inner lagoon of the sanctuary as their harbor. The same area also serves as the landing and loading zone for the glass-bottom boats.

Boat hulls, anchors and chains have reduced to rubble the coral in the mooring area. Water quality has suffered due to discharges of oil, trash and fish debris in the water during cleaning operations. Bottom sediments disturbed by boat wakes later settle on the corals, block the passage of water and light and eventually smother coral organisms.

The Ministry of Fisheries and Aquatic Resources Development (MFARD) has proposed to improve Hikkaduwa Harbor to accommodate all the fishing boats. Although the harbor itself is protected from the seas, the one narrow entrance into the harbor is dangerous during heavy waves because of submerged rocks. The harbor also lacks basic shore facilities such as fresh water or toilets, fuel station, ice supply, loading dock, and an easy access road. The facility needs of the community must be assessed and a management plan developed.

Impacts of Swimmers, Snorkelers and Surfers

Swimmers, snorkelers and surfers damage the coral reef by climbing, standing or walking on the reef flat. Sometimes they stand on the reef to rest. Surfers walk on the coral while crossing the reef in order to reach the waves. People also break off coral pieces to take as souvenirs.

These impacts can be prevented through public education and the presence of enforcement staff. Presently, there are a few prominent signboards on the beach but very little other education occurs except in the

2 Management of Hikkaduwa Marine Sanctuary

hotels. The DWLC has 4 staff posted at the sanctuary but with no uniforms or office they are invisible. There is no attempt to educate the hundreds of local tourists who come daily for a glass-bottom boat ride or a quick swim.

Creating a sanctuary headquarters and visitor's center is a high priority to provide a central focal point for sanctuary activities. Such a facility can provide the DWLC staff with a permanent base and serve as an educational center where visitors and residents can learn about the reef and sanctuary. A tract of Cooperative Society land, the last vacant parcel abutting the sanctuary waters, is centrally located in the sanctuary and provides shoreline access for the public. The value of this site as a research and educational facility and for administration and sanctuary management activities is very high. Presently it is used as a parking lot and boat yard by the Cooperative Society.

Intensive Beach and Sanctuary Use

Overcrowding on the beaches and in the sanctuary occurs during the tourist season. Thousands of local tourists may visit during a single holiday weekend for sea bathing and glass-bottom boat rides. Most of the visitors concentrate in the sanctuary because public access to other beaches is a problem. Private properties virtually barricade all access from Galle Road to the beach except for two small public rights of way within the sanctuary and a couple more along the south coast. Consequently, day visitors have little direct access to the water and no public facilities such as changing rooms, showers or toilets.

Overcrowding is further exacerbated as beaches shrink due to natural coastal erosion processes and encroachment of structures. It is believed that the groin of the fisheries harbor also has trapped sand and prevented the replenishment of adjacent beaches. The result is damage to the sanctuary and conflict between the fishermen, the recreational users of the sanctuary and the tourist industry.

2.3 Objectives and Policies for Sanctuary Management

The sanctuary conditions will continue to degrade and biodiversity will decline if these problems and causes are not reversed. Tourists find that the overcrowded beach and hazardous boating conditions detract from their enjoyment of the sanctuary. Consequently the appeal of Hikkaduwa for international tourism is diminishing and the local economy will suffer. To prevent this outcome, the HSAM/MSCC has agreed to the following management objectives:

- 1. Protect and improve the quality of the coral reef ecosystem and biodiversity in the sanctuary;**
- 2. Develop a well trained and motivated sanctuary staff and provide them with the tools necessary for law enforcement;**
- 3. Build community and public awareness about the importance and potential benefits of Hikkaduwa Sanctuary;**
- 4. Elevate the status of the sanctuary and establish a source of revenue that can be targeted for sanctuary management activities; and**
- 5. Reduce damage to the sanctuary from fishing and glass-bottom boats.**

The following policies are adopted to achieve the objectives with the DWLC playing a key role in the process. Appropriate members of the HSAM/MSCC shall:

1. Actively seek to rehabilitate the Hikkaduwa Fishery Harbor and to move the fishing boats from the sanctuary;
2. Regulate the activities of glass-bottom boats operating within the sanctuary to improve the health of the coral reef, to ensure safety and to enhance the experience of visitors;
3. Prevent the removal or destruction of marine organisms from the sanctuary through education of the public and the active physical presence of sanctuary management personnel;
4. Develop an administration facility to serve as a sanctuary visitor's center and education facility that is supported by revenues collected as local sanctuary user fees; and
5. Promote and sustain income generation through tourism and fishery activities in a manner that is environmentally sound and ecologically sustainable.

2.4 Strategies and Actions for Sanctuary Management

Strategy 1 Use the physical presence, patrolling and observation of DWLC personnel for educating sanctuary users and enforcing sanctuary regulations as key activities in managing the marine sanctuary.

2 Management of Hikkaduwa Marine Sanctuary

- Actions**
1. Provide a permanent sanctuary office and education facility (see Strategy 2).
 2. Upgrade to Nature Reserve status with new boundaries.
 3. Train DWLC Guards and local police for joint patrols, sanctuary management, education and enforcement (DWLC, Police).
 4. Develop a watch schedule and conduct regular day and night surveillance of sanctuary users by DWLC guards, police and volunteer groups (DWLC, Police).
 5. Use the sanctuary boat and a rescue surfboard to patrol and establish an on-the-water presence (DWLC, CRMP).
 6. Provide brightly colored, functional uniforms to highlight DWLC sanctuary staff (DWLC).
 7. Conduct a school contest to design a simple logo for the sanctuary and a t-shirt design (DS, DWLC).
 8. Install “no standing” signboards on the reef flat (DWLC).
 9. Conduct awareness programs for all users of the sanctuary through brochures for tourists and education programs for hoteliers and other tourist businesses (DWLC, CCD, CRMP).
 10. Install swim floats to serve as rest stations and to concentrate swimmers in sanctuary areas that are less vulnerable to damage (NARA, DWLC).
 11. Adopt regulations for enforcement without exception (DWLC) which:
 - a. Limit the number and activities of 50 boats allowed to operate and moor in the sanctuary by the PS;
 - b. Prevent any collection of coral, live rock, reef fish and invertebrates from sanctuary area;
 - c. Specify the use allowed in each sanctuary zone such that the research zone disallows all entry except swimming, the general zone A allows only snorkeling and swimming and the general zone B allows glass-bottom boats and swimming (Figure 2.1);
 - d. Designate the use of a queue and a loading zone for glass-bottom boat operations; and
 - e. Prohibit pollution of the sanctuary.
 12. Place and maintain shore markers, research zone buoys and outer boundary buoys so that the bounds of the sanctuary are clearly represented and to separate conflicting uses (DWLC, NARA).
 13. Enforce the penalty fine system to encourage boat operators, fishermen and swimmers to obey the regulations (DWLC, Police).
 14. Construct and maintain two (2) elevated guard stations on the beach so that DWLC guards have watch posts (DWLC).

- Benefits**
- Increased visibility and presence of staff will deter willful violation of sanctuary regulations.
 - Staff becomes more experienced and confident about working with the public and resource users; deters ignorant violation of sanctuary regulations.
 - Staff and community develop more feeling of ownership for the sanctuary.
 - Attractiveness of the sanctuary for tourism is maintained and enhanced.

Box 2.1 Training and technical assistance to DWLC staff

The DWLC has stationed three Wildlife Guards and an Assistant Ranger to the Hikkaduwa Marine Sanctuary and appointed an Assistant Director to supervise them. Beginning in 1993, CRMP, NARA and CCD have collaborated with DWLC to provide training and technical assistance for these staff. This has included:

- International training on SAM planning;
- Instruction on swimming and snorkeling;
- Purchase of a patrol boat and motor;
- Training on boat operation and maintenance;
- Use of the CRMP office as a temporary office for the guards;
- Facilitating a marine survey and gazetting of new sanctuary boundaries;
- Design and installation of three swimming floats for snorkelers and swimmers in the sanctuary lagoon; and,
- Design and delivery of T-shirts for sanctuary staff uniforms.

Strategy 2 **Develop a Sanctuary Visitors Center, Education Facility and Program** by: negotiating with the local Cooperative Society and collaborating to open a sanctuary visitors center; using the funds pledged by the Global Environment Fund (GEF) to pay for the capital costs of construction; establishing a trust fund with revenues from local sanctuary user fees established by the HSAM/MSCC to cover operation costs; promoting a concession for souvenirs and the operation of the aquarium/education center in conjunction with the Cooperative Society; and developing education materials and programs at the visitor center.

- Actions**
1. Determine the uses of the proposed center and estimate the amount of land area required (HSAM/MSCC).
 2. Develop a business plan to estimate the amount of revenues that can be expected from entrance fees and concession profits and also the cost of operation (HSAM/MSCC).
 3. Negotiate an agreement on the use of the Cooperative Society land (DWLC, NARA, DS, Cooperative Society, CCD).
 4. Obtain funds to design and prepare construction plans for an office building with an aquarium, public toilet and staff quarters (DWLC, GEF, Cooperative Society).
 5. Prepare the bid contract and supervise construction of the center (DWLC, GEF, CCD).

2 Management of Hikkaduwa Marine Sanctuary

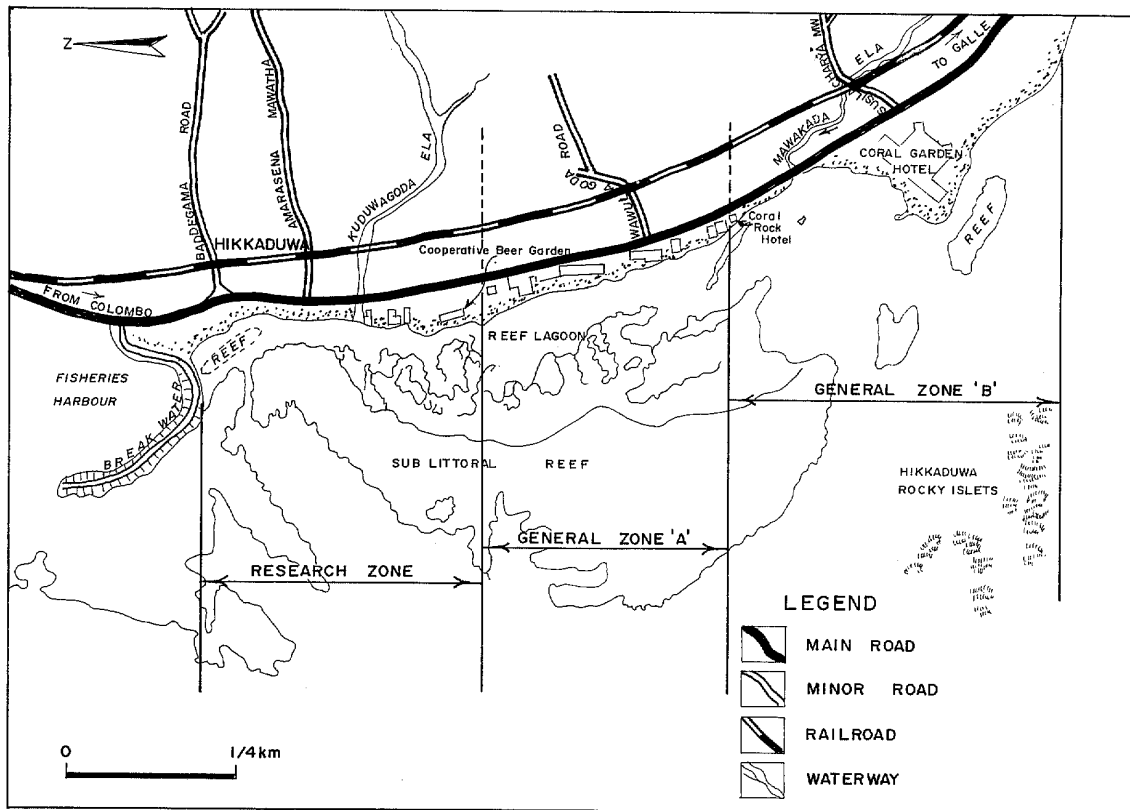


Figure 2.1. Zonation of Hikkaduwa Marine Sanctuary as proposed by De Silva and Rajasuriya in 1985^B

6. Develop an education program based at the visitor center (DWLC, NARA, GEF, CCD).
7. Create a nongovernmental organization to help manage and support the sanctuary and establish a sanctuary Trust Fund which is financed by user fees from GBB passengers and donations by hoteliers (HSAM/MSCC).
8. Placement of road sign advertisements: "Entering Hikkaduwa Marine Sanctuary. Please protect this national treasure" (HSAM/MSCC, Hotels).

Benefits

- DWLC permanent office facility in an ideal location for surveying the sanctuary and space for NARA research facilities.
- Education of tourists and residents about the values of coral reefs with multilingual displays, including the first national aquarium and touch tank in Sri Lanka.
- Boat user and aquarium admission fees and souvenir concession profits to cover the cost of the sanctuary center and staff.

- Increased public access to the sanctuary and facilities for day visitors, including toilets and trash cans.
- A unique tourist attraction to draw visitors earn income from a souvenir concession stand.

Box 2.2 Sanctuary Management Fund

Members of the GBBOA have agreed to start a sanctuary fund with small donations from persons using the sanctuary. For example, each passenger who rides in a glass bottom boat will be asked to give a contribution. Another source could be donations from the hotels for every day that a room is rented. The fund would be controlled by a Board of Directors with representation from the DS, PS, GBBOA, Hotels, DWLC, NARA and CCD. Possible uses of the fund include:

- construction of a GBB loading dock;
- trash collection along the beach;
- construction and maintenance of public toilets;
- operation of a tourist education center;
- wages for a sanctuary manager, night guard and persons to operate the GBB passenger loading queue; and,
- manufacture and sale of sanctuary souvenirs.

Strategy 3 **Rehabilitate the Fishery Harbor and Move Boats out of the sanctuary** by coordinating with the fishing community and the Ministry of Fisheries and Aquatic Resources Development through a community management committee in order to determine facility needs in the harbor and to organize management of the new facility. Use sand from dredging the harbor to fill old lime pits, re-level the area around the rail station, playing field and DS office.

- Actions**
1. Inform the MFARD/Asian Development Bank Project about the relevant strategies in the Hikkaduwa SAM Plan and raise the awareness of the MFARD about the urgency for rehabilitating the harbor (HSAM/MSCC, CRMP).
 2. Provide the MFARD with the existing background socioeconomic information gathered by the CRMP and assist with feasibility study (CRMP, CCD, DFEO).
 3. Identify funding sources for assessing the harbor site, developing plans and implementing the rehabilitation (MFARD).
 4. Reform and strengthen Fisheries Cooperative Societies (DFEO, DS, FCS).

2 Management of Hikkaduwa Marine Sanctuary

5. Facilitate meetings between the MFARD and the affected fishermen to develop a plan for locally managing the improved harbor facility and allocating mooring sites (CRMP, DFEO, DS, FCS).
6. Develop specifications for the harbor and the shore facilities (Harbor Corporation, DFEO, FCS, GBB, MFARD).
7. Identify use for harbor sand and issue permits for removing sand from the Harbor area (CCD, DS).
8. Transfer of fishing boats to harbor (DWLC, MFARD).
9. Widen and mark the narrow channel to the harbor to improve safety of harbor use (Harbor Corporation, MFARD).
10. Provide for collection and disposal of used engine oil (Harbor Corporation, FCS).

Benefits

- Improve reef and water quality of the sanctuary.
- Reformed and strengthened Fisheries Cooperative Societies can more effectively link with the MFARD and meet the needs of the fishing community.
- Conflicts between fishing, tourism and recreation users and stakeholders will be reduced.

Box 2.3 Renovation of the Fisheries Harbor

The plight of the fishermen and the sanctuary has reached the attention of decision-makers within the MFARD through the SAM planning process. Requests for assistance were channeled through the HSAM/MSCC, NARA, CCD and CRMP. In response, the Minister of Fisheries visited Hikkaduwa and agreed to renovate the harbor by removing sand, improving the breakwater and harbor entrance and by providing shore facilities. Funds from the Asian Development Bank Fisheries Project have been allocated and a ground-breaking ceremony was held in February 1996 to commemorate the start of work.

Strategy 4 Regulate the operations of glass-bottom boats in the sanctuary through cooperation between the Glass-bottom Boat Owners Association, DWLC and the Pradeshya Sabha; adopt and enforce regulations which provide for safe and environmentally friendly operation of the GBBs and limit the number of GBB trips.

Actions

1. Facilitate the formation of the Glass-bottom Boat Owners Association (GBBOA) and strengthen its planning and management skills (CRMP, DS).

2. Discuss with GBB owners and operators to adopt the recommended regulations (DWLC, PS, Police)
 - All boats operating in the Hikkaduwa Sanctuary must obey rules and have a current PS license,
 - All boats shall prominently display the rules, regulations, permit and their registration number,
 - No boat shall carry more than a maximum of nine (9) passengers
 - All boats shall have a licensed operator (coxswain).
 - All boats shall carry enough life jackets or preservers to provide one for each passenger and crew member,
 - All boats shall operate only within designated areas.
 - Any children under age of 12 shall be accompanied by an adult,
 - All boats shall be properly maintained so as to operate safely and in an environmentally sound manner.
3. Limit the number of sanctuary permits given annually to 50 boats; permits may be sold or transferred between interested parties with approval of the granting agency (DWLC, GBBOA, PS).
4. Conduct workshops for boat owners and operators regarding the sanctuary regulations, coral reef ecology and boat/ engine maintenance (DWLC, CRMP, NARA).
5. Assist the GBBOA to obtain boat training, certifications and group insurance privileges (Harbor Master, GBBOA, CRMP).
6. Designate GBB mooring areas and a passenger loading area; build a loading dock with a space for the sanctuary patrol boat (DWLC, GBBOA, CCD, NARA).
7. Adopt a queue system which will serve passengers in a regular and organized fashion and limits the number of boats operating on the water to 12 at any given time (GBBOA, DS, DWLC, PS, CRMP).
8. Adopt a ticketing system that will permit collection of a small fee or donation from each passenger for sanctuary management (PS, GBBOA, DWLC).
9. Provide for collection and disposal of used engine oil (Harbor Corporation, GBBOA).
10. Install two (2) anchoring floats for GBBs at Rocky Islets (DWLC, GBBOA, NARA).

Benefits

- Coral quality improved by reducing damage from accidental grounding and excessive boat use in sanctuary.
- Improved safety for swimmers and boat passengers.
- Revenues generated for managing the sanctuary by GBB license fees and by local sanctuary user fees and donations.
- Awareness of coastal resource management issues raised among boat owners and operators, the tourist industry and tourists.

Box 2.4 Glass-bottom Boat Owners Association (GBBOA)

Glass-bottom boats have dramatically increased in numbers from 20 in 1987 to more than 60 in 1996. To protect their interests and to participate in the SAM Planning process, many owners have joined to form a professional organization. Through the organization, the boat owners have agreed to license their boats through the Pradeshyā Sabha, restrict their numbers and the location of the operation, and form a queuing system to facilitate the distribution of passengers. The GBBOA also has informally agreed to donate a portion of their rental fee to a Sanctuary Management Fund. One management challenge is to convince all of the boats to join the organization and abide by its self-regulating decisions. This may require an edict from DWLC which allows only members of the GBBOA to operate for hire in the sanctuary.

Strategy 5 Develop and implement a research and monitoring plan for the sanctuary through the collaboration of DWLC, NARA and universities.

- Action**
1. Link the research and monitoring program and the HSAM/MSCC so that zoning and management strategies can be adapted in response to findings (HSAM/MSCC, CCD).
 2. Secure funding for water quality testing and research and monitoring program (DWLC, NARA).
 3. Assign research and monitoring management to NARA in collaboration with DWLC and universities (HSAM/MSCC).
 4. Determine indicators and establish a schedule for monitoring environmental quality within the sanctuary (NARA).
 5. Train DWLC staff and local volunteers to conduct appropriate research and monitoring tasks (DWLC, NARA, Colombo University).
 6. Supervise and implement monitoring for agreed indicators (NARA).
 7. Experiment on coral settlement and artificial reef placement (NARA, Colombo University).

- Benefits**
- Changes in reef quality monitored to determine effectiveness of management activities;
 - Guidance for later modifications to the SAM plan; and
 - Information on coral growth will help estimate the recovery time for damaged coral and will improve plans for reef rehabilitation.

**Box 2.5 Sanctuary coral research by
NARA and Colombo University**

NARA and Colombo University have embarked upon a joint research project to determine the relative importance of different reef destruction factors, such as sewage, sedimentation and physical damage. They are also studying the growth, renewal and settlement of coral to determine appropriate ways to restore and rehabilitate the reef. A research zone was marked by floating buoys within the sanctuary. Members of the Sub-aqua Dive Club and DWLC staff received training on basic research methodology, coral reef ecology and reef management. The studies will help to link policy-making with actual field experiences and assist the HSAM/MSCC to make appropriate decisions about sanctuary management strategies.

Chapter 3

MANAGEMENT OF WATER QUALITY AND WASTE DISPOSAL

3.1 Introduction

The coral reef and the marine waters are the main attraction of Hikkaduwa. Poor water quality adversely affects marine life, is aesthetically displeasing and creates health problems. Swimming and snorkeling are popular activities which are negatively affected by poor water quality. Few persons enjoy swimming in oil or seeing coral covered with plastic and other trash. Low water clarity due to suspended sediments hinders viewing corals from GBB's as well as coral growth and health. Ultimately if reef quality declines and Hikkaduwa town sanitation is poor then the attraction of the area for the tourist industry will lessen and adversely affect the local economy.

A number of regulations have been enacted and organizations charged with responsibility to prevent water quality degradation.⁵ They include:

- **The National Environmental Act No. 47 of 1980 and amendment No. 56 of 1988** forbids any pollution of inland or marine waters which is detrimental to the natural environment, organisms or humans.
- **The Marine Pollution Act No. 59 of 1981** authorizes appropriate authorities to prevent, reduce and control pollution in Sri Lankan waters from marine or land-based sources.
- **The Coast Conservation Act No. 57 of 1981 and amendment No. 64 of 1988** prohibits the intrusion of waste or foreign matter to the coastal zone from a source within or outside of the zone which adversely affects the quality of the environment, water body or organisms present.
- The National Aquatic Resources Agency (NARA) is mandated to collect periodic data on oxygen, nutrients, selected toxic chemicals content and other water quality parameters to predict changes or trends in the levels of pollution and to evaluate the existing water quality management programs at particular sites.

The book, *Environmental Guidelines for Coastal Tourism Development in Sri Lanka* is also a good reference on preventive methods to minimize pollution from tourism development.¹⁴

3.2 Problems and Issues of Pollution

Pollution in Marine Waters

Water quality in the sanctuary and the nearby coastal areas is variable depending on several factors, including location, pollution source, weather patterns and time of year. At present, the water quality of the Hikkaduwa sanctuary is declining but is still suitable for recreational use and for the growth of the coral reef.⁶ Adequate water quality is sustained by the high flushing action of the waves passing over the reef.

During the dry season when wave action is decreased and mixing is less, stagnant areas of polluted water occasionally develop close to shore. During the wet season, greater mixing occurs close to shore but it is also the time when two brackish water outlets (the Koduwegoda and Mewakada Canals) are open and large volumes of polluted water are discharged. These seasonal sources carry substantial contaminant loads including domestic sewage, garbage, sediments, agrochemicals and materials left from retting coconut fiber. More information on the water quality of Hikkaduwa is presented in *The Coastal Environmental Profile of Hikkaduwa*.¹¹ Other sources of pollution include:

- a. garbage that was improperly discarded in drains, stream beds and along the beach and roads;
- b. a direct discharge of primary treatment sewage from a major hotel and occasional direct discharges of non-treated sewage from several other large hotels;
- c. direct discharges from two brackish water canals which carry domestic sewage and other waste;
- d. storm-water drains which discharge rainwater mixed with oil and other substances from the highway and surrounding areas;
- e. direct discharges of fuel, oil, garbage and fish from glass bottom and fishing boats anchored in the area;
- f. indirect discharges of sewage through the groundwater from smaller (30-60 room) hotels and other establishments using septic tank sewage disposal systems;
- g. oil from large ships passing outside of the sanctuary; and,
- h. bottom sediments stirred up by the movement of boats.

Improper Dumping of Solid Waste

Solid waste refers to materials such as food wastes, garden and lawn trimmings, bottles, cans, metals, plastic bags and residues from commercial or industrial processes. The existing solid waste disposal system in Hikkaduwa cannot keep up with the amount of waste generated. During the tourist season

this can be up to 30 cubic meters per day. Increasing amounts of solid waste are being indiscriminately deposited on vacant lots and the beach, in the water ways and canals, and along the roadside. There are no bins in public areas of the road or beaches. This dumping is not only unsightly but it poses health risks and creates a nuisance by attracting flies, dogs, cows, crows and rats. The rapid growth of the area over the last 25 years has overpowered the municipality's ability to maintain adequate service. A baseline study on the solid waste situation in Hikkaduwa was recently completed by Tantrigama and Nakashima.¹⁵

The town of Hikkaduwa does not have a permanent and adequate site for proper disposal of solid waste. There is a shortage of suitable land disposal sites and it is expensive to develop a new environmentally sound landfill. The Sanitary Officer of the Pradeshya Sabha supervises daily the garbage collection tractor and work crews but the equipment is limited and there are no alternate drivers. Although some hotels arrange for their own waste disposal, most feel that they already pay for waste disposal in their local taxes so there is little incentive for hotels to do more about the situation.

Inadequate Wastewater Disposal Facilities

Wastewater includes water from bathing and from washing clothing or dishes. Wastewater also can originate in commercial or industrial sources. Sewage is the wastewater from toilets containing feces and urine. In Hikkaduwa, disposal of wastewater occurs in many forms. Water from sinks and showers frequently is directed onto the ground or into pipes where it flows untreated into a canal or river. Most hotels discharge their sewage into a septic tank or a seepage pit. Here, the solid materials are left in the chamber of the tank or pit and the water soaks into the soil and eventually enters the ground water. Such systems need to be maintained so that the soil can continue to absorb the wastewater. The septage (sludge, solids, and grease that collect inside the septic tank) needs to be removed regularly by a suction tank truck and disposed properly. Formerly, a truck came from Galle to service Hikkaduwa but the service is no longer available. Now there is no place available to dispose of the septage without creating a nuisance and health hazard.

Water discharged into the ground adjacent to the sanctuary eventually flows into the sanctuary or the nearby waters. An investigation also found that two seasonal fresh water canals, Koduwegoda and Mewakada Canals, receive sewage and wastewater and are sources of pollutants for the sanctuary.⁶ Some tourist establishments directly release semi-treated sewage to the sanctuary. In other instances, raw wastewater is secretly pumped into the sanctuary as a result of overflow from septic tanks. Thus, the water quality of the SAM site will continue to degrade unless management actions are taken.

3 Management of Water Quality and Waste Disposal

A preliminary design for a centralized wastewater collection and treatment system for Hikkaduwa was produced in 1994 for the Central Environmental Authority.¹⁰ The study originally was designed to handle only the wastes of the hotels along Galle Road. The other areas that have adequate area and suitable soil conditions would continue to use in-ground septic tank sewage disposal systems.

Funds from an international donor are being sought to cover the capital costs for construction of the wastewater collection system, the treatment facility and the discharge outfall. An alternative is to link a private sector investor with local government. A private firm might contract with a town to provide municipal infrastructure such as wastewater treatment and solid waste facilities. Local fees for service would pay for the construction, operation and maintenance of the facility.

Inadequate potable drinking water supply

The water quality of Hikkaduwa cannot be separated from the potable water supply for domestic and tourist industry use. The present central water supply system only services people along Galle Road. As the size of the community grows, the demand for water will probably exceed the available supply.

Many households must use wells to withdraw ground water even though it tends to be salty due to the proximity to the ocean. The well water increasingly also has been found to contain sewage and household chemicals discharged through in-ground sewage disposal systems. Presently there is very little control over the placement of wells or over the amount of water that can be withdrawn. This poses health problems for residents and can adversely affect the tourist industry.

3.3 Objectives and Policies for Management

The overall objectives supported by this management plan regarding waste management through the HSAM/MSCC are to:

- 1. Improve water and overall environmental quality in the SAM area so that the community and tourism industry can grow in a sustainable manner;**
- 2. Reduce the amount of raw or poorly treated wastewater entering the sanctuary;**
- 3. Eliminate the trash and solid waste which accumulates in public areas and enters the sanctuary; and,**

4. Develop a fee system to pay for operation and maintenance of waste disposal systems.

The policies agreed by the HSAM/MSCC to reduce pollution in Hikkaduwa are to:

1. Build linkages between the regional government, Pradeshya Sabha, CEA, the tourism industry and private business to solve the problems of wastewater and solid waste disposal;
2. Support methods to reduce the volume of waste disposed, including conservation of water, recycling and composting of solid wastes;
3. Facilitate the planning and implementation of appropriate and affordable solid waste and wastewater disposal systems;
4. Support the “polluter pays” principal in developing methods to collect fees that cover the costs for disposal of waste; and,
5. Support actions which improve the distribution of safe drinking water, reduce demand for water and conserve water.

3.4 Strategies and Actions for Implementation

Strategy 1 **Implement an appropriate solid waste disposal system** through the Pradeshya Sabha with assistance from the municipality of Galle by sharing a sanitary landfill disposal site. Use local pick up and transport by government (PS) staff and improve the tax collection system to pay the cost of operation. Encourage recycling and composting to reduce the amount of solid waste and the cost for disposal.

- Actions**
1. Facilitate discussions between the PS, hoteliers and other establishments to define the problem (HSAM/MSCC).
 2. Conduct and publish a study defining the solid waste problem in Hikkaduwa (CRMP).
 3. Integrate composting and recycling to reduce the amount of material to be disposed in a landfill and to provide additional sources of income generation for unskilled laborers (PS, HSAM/MSCC, Cooperative Society, Hoteliers).
 4. With assistance from MEIP, collaborate with Galle to locate and establish a sanitary landfill that operates within the environmental regulations (PS, DS, Provincial Council, MEIP, CEA).
 5. Based on volume of waste, improve the tax collection system to finance a waste collection system and operation of a disposal site (PS, HSAM/MSCC).

3 Management of Water Quality and Waste Disposal

6. Purchase and maintain waste collection trucks for solid waste (PS).
7. Implement a system to impose fines to discourage anybody from improperly dumping solid waste (PS, Police, PHI).
8. Conduct awareness campaign; encourage community groups to conduct regular beach and roadside cleanups twice per year; hire street and beach cleaners as required (PS, NGO, Hotels, DS).
9. Install trash bins along Galle Road and on the beach; ensure that the bins will be regularly emptied (PS).

Benefits

- Cleaner environment for the beaches and town area.
- Improved tax fee structure to pay for cost of disposal.
- Shared costs in development and operation of the disposal site.
- Reduced health risks from uncollected waste, unsanitary open dumps, rats and flies.
- Enhanced environmental quality for tourists will make Hikkaduwa more competitive as resort destination.

Box 3.1 Solid waste solutions

A 1995 study identified the problems and potential solutions of solid waste (garbage and refuse). Most materials came from the hotels, guest houses and restaurants as discarded food and recyclable (reusable) materials such as paper, metal, glass and plastics.¹⁵

Since developing a new environmentally sound landfill is expensive, the study recommended that Hikkaduwa reduce the amount of material that ultimately needs to be disposed. It proposed that a recycling system be tested on a trial basis to collect the recyclable materials and sell them for reuse to several companies in Colombo. One suggestion was to setup a cooperative to collect refuse for recycling. The cooperative would pay people for the recyclables and make a small profit by selling them to Colombo buyers. The system also would provide employment for unskilled workers. A second suggestion was to investigate processes that decompose organic waste, such as food waste from hotels and restaurants, to produce organic soil conditioners or biogas.

One innovative proposal combines the process for sewage treatment with garbage disposal to produce biogas. The biogas would fuel a turbine that produces electricity for sale to the main Ceylon Electricity Board power grid and thus offset disposal costs.

Strategy 2 **Develop a wastewater treatment system to service the tourist establishments and town center** through cooperation between the tourist industry, the local government, Central Environmental Authority and National Water Supply and Drainage Board. Establish a treatment facility with funding from either a private investor or international donor; and develop a local user fee system to pay for operation.

- Actions**
1. Identify all sources of pollution with inadequate wastewater treatment systems, e.g. tourist establishments, commercial businesses, government buildings and the markets (PHI, CEA, MOH, DS, GN).
 2. Establish contacts with private investors and international donors to fund the capital costs of construction (HSAM/MSCC, CEA, CCD, NWSDB).
 3. Update the CEA wastewater disposal plan to verify the design parameters, develop actual design specifications and construction plans (CEA) which includes:
 - Disposal of the septage taken from septic tanks;
 - Capacity in the wastewater collection system to serve other high density areas, such as the market area, the shops around the bus stand and Pradeshya Sabha; and,
 - Use of managed wetlands or other biological methods for final treatment of the wastewater collected in Hikkaduwa and to recharge groundwater.
 4. Implement the central collection and wastewater treatment system and treatment facility for septic tank sludge (CEA, NWSDB, PS).
 5. Develop and implement a fee system which pays the local costs for operation and maintenance of the wastewater collection and treatment system (NWSDB, PS, HSAM/MSCC).
 6. Provide technical assistance to establishments with inadequate waste water systems to improve their system (CEA, MOH, NWSDB).
 7. Purchase and maintain suction tank pump truck for collection and transport of septage and sewage (PS).
 8. Construct and maintain public toilets for the sanctuary (PS).

- Benefits**
- Improved water quality of the sanctuary and nearby waters.
 - Upgraded wastewater treatment systems for tourist establishments.
 - Improved groundwater quality.
 - Decreased health risks, medical costs and illness.

Strategy 3 **Reduce the entry of pollutants and sediments into the sanctuary and surrounding sea** by identifying all point and non-point sources, by enforcing pollution control regulations and through community peer pressure.

- Actions**
1. Educate the community, hotels, restaurants, GBB and fishing boat operators to discourage discharge of oil and other wastes in marine waters (DWLC, DFEO, HSAM/MSCC).

3 Management of Water Quality and Waste Disposal

2. Move the fishing boats out of the sanctuary mooring site (DWLC, MFARD, DFEO, FCS).
3. Develop a waste oil disposal system at the Fisheries Harbor for use by fishing and glass-bottom boats (Harbor Corporation, FCS, DFEO, GBB).
4. Coordinate with Road Development Authority (RDA) on future plans for drains from highway into marine waters to minimize any flow into the sanctuary (HSAM/MSCC, RDA, CCD).
5. Identify and remove pollution sources discharging to the Koduwegoda and Mewakada Canals by:
 - a. characterizing type of pollutants;
 - b. monitoring flows out of the outlets;
 - c. requiring on-site treatment or connection to central treatment facility; and,
 - d. public education (PHI, DS, GN, NARA, MOH).
6. Control land use and construction in the canal basins to reduce pollution and sediment loss (UDA, DS, PS, PHI).
7. Coordinate cleaning or dredging of canals to occur during dry season to minimize flow of sediments and pollutants to sanctuary (UDA, DS, PS, PHI).
8. Coordinate water quality sampling of the canals and marine waters (NARA, Colombo University, CEA, PS).

Chapter 4

SHORELINE DEVELOPMENT, INFRASTRUCTURE AND ENVIRONMENTAL IMPROVEMENTS

4.1 Background

The Hikkaduwa coral reef provides a special appeal for tourists to Hikkaduwa but it is not the only attraction. Most of the tourist activities are concentrated primarily around the 14 ha of beaches. These beaches provide the setting for numerous hotels, shops, restaurants and businesses catering to the tourists. Unfortunately, the beaches are narrow and the area available for coastal development is limited by the proximity of Galle Road to the beach.

The beach in the SAM area is divided into two distinct sections and described in *The Coastal Environmental Profile of Hikkaduwa*.¹¹ The northern section extends south from the Hikkaduwa River to the sanctuary's southern boundary by the Coral Gardens Hotel. The southern section starts from the southern boundary of the Coral Gardens Hotel and extends to Kumarakanda.

In the northern section, the Galle Road is located very close to the shoreline. The narrow coastal strip in this section is often without beach space because hotels are constructed on the shoreline. The result is a high density of tourist establishments and encroachment on the beaches. This has a significant impact for establishments in areas subject to erosion.

Sedimentation of eroded soils adversely affects coral reefs and impacts the use of coastal resources. In addition to accumulating and smothering live coral, sedimentation also reduces the capacity of the harbor to accommodate boats. Sedimentation results from: (a) materials carried by the outflow from the two fresh water canals; (b) construction of coast protection structures (for example, the groin at the southern end of the Fisheries Harbor has trapped sediments within the Harbor); and (c) construction of revetments and buildings too close to the beach.

4 Shoreline Development, Infrastructure and Environmental Improvements

4.2 Problems and Issues

Unregulated Beach Construction

The lack of a planning framework for tourism or coastal development prior to the 1980's allowed development activities to proceed in an ad-hoc manner. Since 1980, the government has enacted a number of laws relevant to coastal resource management. The Coast Conservation Act of 1981 mandated the creation of the National Coastal Zone Management Plan (CZMP) which included management policies to prevent coastal erosion, improve habitat protection, and preserve important cultural and recreational areas. A significant feature of the Coast Conservation Act of 1981 and the National CZM Plan was the establishment of setback requirements for all coastal development and other policies which include:⁵

- CCD will ensure that adverse impacts from increases in fresh water runoff and sediments and the introduction of water borne pollutants will be minimized when considering proposed development in the vicinity of coral reefs.
- Construction within the coastal zone will be permitted only in accordance with the setback standards.
- The permit process for construction within the coastal zone will be devolved to the provincial level and through the Special Area Management process.
- Removal of sand from non-accreting beaches, barrier beaches and spits is prohibited.

In addition to the CZMP provisions, the Urban Development Authority has passed several acts regarding development planning. The Urban Development Authority Law No. 41 (1978) and Amendment Act No. 4 (1982) made provisions for UDA to formulate and implement an urban land use policy. The policy for urban development areas provides for: allotments, reservations or zoning of land for different purposes; control of pollution and environmental quality; landscaping; and the preservation of views or prospects, places of historical or architectural interest, and scenic beauty. It also designated all areas within 1 km of the coastline as "urban areas".

Despite the adoption of the above policies, unauthorized building continued mainly because of the lack of enforcement or implementation. For example, the UDA developed a land use policy and plan for Hikkaduwa in 1987 which was never implemented.¹⁷ Contributing causes are: (a) the Divisional Secretariat has insufficient capacity and experience for implementing the Coast Conservation Act guidelines; (b) personnel for local level surveillance and monitoring are lacking; and, (c) in Hikkaduwa the narrow coastal strip has forced building near the beach.

Traffic Congestion and Noise

As tourism has grown in Hikkaduwa and as the southern coastal communities have developed in general, the number of vehicles passing through Hikkaduwa has increased dramatically. There is only one main road through town; vehicles moving at high speeds thus endanger pedestrians and cyclists. Accidents and pedestrian fatalities have occurred, including tourists. The rate of traffic accidents and fatalities involving pedestrians is increasing as vehicles continue to travel at reckless speeds, even in congested areas. In recent surveys, traffic noise and congestion was repeatedly cited as a serious problem by tourists, owners and managers of tourist establishments in Hikkaduwa. Contributing causes include:

- a. there are no speed limit signs and lax law enforcement;
- b. drivers are careless;
- c. no speed bumps or other methods of traffic control are in place;
- d. no sidewalks or off-street parking; and,
- e. road width is narrow and the line of vision is obstructed by curves and buildings near the road.

4.3 Objectives and Policies for Management

The HSAM/MSCC supports the following management objectives to improve the overall environment in Hikkaduwa:

- 1. Maintain the maximum amount of beach area and public access to the beach;**
- 2. Control unregulated or illegally planned construction and development in SAM area; and,**
- 3. Make Hikkaduwa a more pleasant and safe place to visit by reducing noise pollution and the speed of vehicles passing through.**

The policy of the HSAM/MSCC is to:

1. Encourage the development of a land use plan and to enforce the national CZM plan guidelines within the SAM site of Hikkaduwa with particular reference to water borne sediments, the setback requirements and beach access regulations; and,
2. Encourage the police of Hikkaduwa to strictly enforce the traffic laws and for the RDA to improve traffic controls.

4.4 Strategies and Actions for Implementation

Strategy 1 Enforce building regulations and CCD setback requirements throughout the SAM area by establishing agreed criteria for use and protection of the beach sand, beach access and use of land as stipulated in the national CZMP and, *Environmental Guidelines for Coastal Tourism Development in Sri Lanka*.¹⁴

- Actions**
1. Place one officer in Hikkaduwa Divisional Secretariat to enforce environmental regulations, to provide technical planning and administrative support for the HSAM/MSCC and to coordinate local environmental activities (CCD, DS, MTEWA, CRMP).
 2. Determine setback and building requirements acceptable for Hikkaduwa beach front (CCD, DS).
 3. Monitor all building activity and require permits (CCD, DS).
 4. Identify all beach public access points and acquire the land for public use (PS, DS, CCD).
 5. Deny permits for reconstruction of older structures encroaching on public access ways or beyond current setbacks and for renovations expected to cost more than 50% of the current value of the existing structure (CCD, DS, PS).
 6. Adopt and enforce fines against new violations of setbacks and require removal of new illegal structures (CCD, PS, DS).
 7. Encourage establishments in violation of current setbacks to maintain beach width through beach nourishment and/or soft stabilization technology, such as vegetation (CCD).
 8. Use sand reserves within the silted harbor for limited beach nourishment along the Hikkaduwa beach front (CCD, NARA, DS, Hoteliers).
 9. Monitor and stop all sand mining in SAM beaches (DS, CCD).
- Benefits**
- Fewer conflicts about beach setbacks and construction near the beach.
 - Improved beach access and beach space for tourists.
 - Decreased beach erosion and beach narrowing.

Strategy 2 Develop a growth management plan for Hikkaduwa to prevent uncontrolled construction, development and pollution.

- Actions**
1. Update the 1987 UDA plan prepared by the Cabinet Subcommittee on Development of Tourist Environment at Hikkaduwa (HSAM/MSCC, UDA).
 2. Enforce CZM Plan guidelines for development (CCD, DS).
 3. Study oceanographic patterns and sediment movements in and around the Fishery Harbor (NARA, LHI).

4. Include Hikkaduwa SAM Plan within the proposed development plan prepared by the Presidential Task Force for Southern Area Development (HSAM/MSCC, UDA).

Strategy 3 Reduce traffic noise and congestion through enforced compliance with traffic laws, large fines, and traffic/ parking controls.

Actions

1. Meet with the police to encourage them to strictly enforce speeding laws during all hours of the day and night (HSAM/MSCC, police).
2. Authorize higher fines for reckless driving and speeding which are collected locally and used for police operations and environmental concerns (PS, OIC).
3. Install electric warning signs along Galle Road (Hoteliers).
4. Reduce speed limit to 40 km/ hour and install more speed limit signs and no-passing lines with ridges or road dividers along Galle Road from Wellawatta to Patuwatha (RDA).
5. Follow up on the UDA proposal to construct a bypass road and make the present Galle Road into a walking and bicycle mall with local traffic only allowed to pass in two narrow lanes (UDA, RDA).
6. Develop off-street parking sites for town center and tourist vehicles visiting the sanctuary (RDA, PS, DS).
7. Develop sidewalks for town center along Galle Road (RDA, PS, DS).

Benefits

- Fewer vehicle accidents and fatalities.
- Quieter atmosphere in the Hikkaduwa area.
- Longer stays by tourists encourage the tourism economy.

TOURISM DEVELOPMENT AND LIVELIHOOD OPPORTUNITIES

5.1 Background

Although tourism and fishing form the economic foundations for Hikkaduwa, tourism is much more prominent and dominates the local economy. Following a period of civil unrest from 1982-89, international tourism rose dramatically as political stability improved. Hikkaduwa became the most popular Sri Lankan coastal resort area tallying 311,726 guest-nights in 1992.¹⁶ Hikkaduwa's 311 tourist establishments and businesses provide direct employment for 1,519 persons and related indirect employment for an estimated 2,126 additional workers.³ This generated about Rs. 110 million of direct economic benefits. Combined with indirect economic benefits, foreign tourism in Hikkaduwa provided total net benefits of Rs. 1,079 million in 1992 compared to local fish landings worth about Rs 33.4 million (L.H.S. De Silva, pers. com).¹⁶

Fishing has declined in economic importance however it still provides significant income to about 600 fishermen living in the SAM area. The fishermen form two groups, those with boats (100) and those without (500). Those with boats, depending on the type, fish in near-shore waters or deep sea waters. Those without boats either fish in near-shore waters or work as laborers on commercial boats. In 1995, sixty-five 3.5 ton multi-day boats operated from Hikkaduwa and landed about 650,000 Kg of fish with a market value of Rs. 26 million.

Decreases in fish stocks and increasing restrictions on fishing technique have altered the character of the fishing industry and reduced the number of jobs available. In general, the near-shore waters are overfished due to growing numbers of fishermen and by illegal fishing practices, such as light-purse seining and dynamite use. A prohibition on light-purse seining techniques was enacted in 1995 to relieve fishing pressure on the nearshore stocks. This reduced the catch significantly.

Traditionally, the reef area within the sanctuary has been used for small-scale commercial fishing, as well as the collection of ornamental fish and mollusks. These activities are now banned except for very limited hook and line fishing for non-reef fish by less than 20 permit holders. About 100 fishermen are also engaged in tourist activities.

5 Tourism Development and Livelihood Opportunities

Within the tourism sector, business is divided between formally recognized Tourist Board-approved establishments (27 businesses) and the numerous smaller informal hotels, guest houses, shops and restaurants. The vast majority (284) of Hikkaduwa establishments are informal enterprises which do not meet Ceylon Tourist Board (CTB) standards and are not registered by CTB. Although vast variations occur in health standards, prices and service quality, this feature is desirable for many “low budget” tourists and also for local visitors.

The impact of local Sri Lankan tourists on Hikkaduwa has not been well documented. Hundreds come on weekends and holidays for short day trips while enroute to other destinations. Their influence on the beach and sanctuary environment is quite significant but their economic contribution, although important, has not been quantified.

Tourism is viewed as a means to create more local employment but it must be approached carefully. Presently, tourism centers on the attractions of the beach and coral reef in the sanctuary as well as on the urban nature of the town. Other attractions of the Hikkaduwa area, such as the lagoon, bird watching, fishing, boating and surfing could be developed. Unfortunately, tourism with its many benefits also brings some negative consequences including environmental degradation and undesirable activities, such as drugs and prostitution. The tourism sector must learn to exist in a manner which supports Hikkaduwa’s environment.

5.2 Problems and Issues

Lack of Alternative Livelihoods for Fishermen and Unemployed Youth

In Hikkaduwa, fishing is not providing enough to sustain the fisher community. Fishermen families often are poor and lack livelihood alternatives. Their orientation to the sea and often poor educational background limits their opportunities for alternative work. Their plight is compounded by a 13 percent national unemployment rate.²

Although tourism could hire more local persons, such as fishermen, there has been poor integration of the two sectors. Most of the small informal businesses are family run and have few vacancies. The larger formal tourism establishments prefer to hire skilled people from outside of Hikkaduwa. Potential outlets for youth in the fishing sector is sport fishing in small boats during the calm season, boating or canoeing in the mangrove lagoon behind Hikkaduwa town, and tourist day-trips on real fishing boats. These options have not been developed yet.

Poorly Trained Tourist Guides and Touts

Hikkaduwa is notorious for many “touts” who are acting as middlemen and promoting glass-bottom boats, boutiques or lodging establishments. The touts like to refer to themselves as tour guides but in reality, from the perspective of the tourist, they can be a major nuisance and detract from the social environment of Hikkaduwa. Education and training for this group of persons is needed to improve the manner in which they relate to outsiders and to enhance alternate opportunities for livelihood.

Tourism Sector Conflicts

Several issues create conflict within Hikkaduwa’s tourism industry. First, the formal and informal sectors do not get along well and there is little cooperation. The “formal” or “Tourist Board Approved Hoteliers Association” is small in number but controls about 45 percent of the tourism revenues of Hikkaduwa. The “informal” sector, comprised of many small establishments, absorbs the larger balance. Although accused of lowering tourist standards by offering cheap prices in poor quality environments, the variety among the informal sector attracts many tourists and makes Hikkaduwa unique among Sri Lankan tourist destinations. The diverse atmosphere of the town is a major attraction.

Second, although the formal sector is governed by more regulations and pays higher taxes to both the national and local government, they feel that there is little benefit in return. Hikkaduwa is not designated as a formal CTB tourist resort area nor does CTB actively promote tourism in Hikkaduwa. Hikkaduwa has neither a special Tourist Police Unit nor is there a Tourist Board office to provide information or services, such as airline flight confirmations. Hikkaduwa needs to link with the CTB national program goals and develop more common ground between the formal and informal sectors. Support for these locally controlled and operated businesses would result in a stronger local economy.

5.3 Objectives and Policies for Management

The HSAM/MSCC supports the following objectives and policies to improve the socioeconomic situation in Hikkaduwa and to promote more integrated tourism development in relation to the coastal environment. The objectives are to:

- 1. Develop new forms of tourism related livelihood for the employment of youth from the community;**

5 Tourism Development and Livelihood Opportunities

- 2. Improve the quality of local tour guide services**
- 3. Improve relations and cooperation between the formal and informal tourism sectors.**

Policies as agreed by the HSAM/MSCC to achieve these objectives are to:

1. Encourage the hoteliers to explore and promote new local tourist enterprises which potentially can employ local youth, such as sport fishing, bird watching, lagoon exploring, boating and surfing;
2. Regularize licensing and promote training opportunities for tourist guides and encourage awareness programmes for visitors; and,
3. Provide opportunities for dialogue between the formal and informal tourism sectors through a unified Hikkaduwa Tour Operators Association for all size and scale of businesses with special attention to the informal sector operations.

5.4 Strategies and Actions for Implementation

Strategy 1 Create alternative employment opportunities for local youths, tourist guides and touts by developing several pilot projects for new tourist activities and providing training and education.

- Actions**
1. Conduct feasibility studies on employment from tourist activities such as bird watching, sport fishing, boating, sailing, lagoon exploration and other small businesses (CTB, Guide Association, Hoteliers).
 2. Conduct a series of training courses in public relations and tour guide services for small groups of young persons (CTB, Guide Association).
 3. Link with the Folk Art Center in Bentota to develop training in traditional crafts and skills (Ministry of Tourism, Provincial Council).
 4. Establish a basic level hoteliers training course in Hikkaduwa (CTB, Hoteliers).
 5. Provide entry level intern positions for hotelier students (CTB, Hoteliers).

- Benefits**
- Decreases dependency on fishing.
 - Increases local employment opportunities.

Strategy 2 Promote cooperation between the informal and formal tourism business sectors by developing a unified tourism association for Hikkaduwa and providing assistance to the informal sector in their business and tour operations.

- Actions**
1. Give full representation to all tourism associations in Hikkaduwa on the HSAM/MSCC and establish a committee to work on improved cooperation (HSAM/MSCC, CTB, tourist associations).
 2. Set up a new tourist association for Hikkaduwa which represents both formal and informal operators to discuss mutual problems and opportunities (HSAM/MSCC, tourist associations).
 3. Provide training opportunities for informal sector in business management, tourist relations and environmental practices (CTB, Hoteliers Association).
 4. Regularize tour guide licenses and increase enforcement (CTB, PS).
 5. Control activities of beach vendors by licensing (PHI, PS).
- Benefits**
- Improves quality of guest facilities.
 - Enhances Hikkaduwa image as tourist destination.

**Box 5.1 Association of Tourist Board-Approved Hotels
of Hikkaduwa (ATBAHH)**

The formal hoteliers established the ATBAHH in 1980 as a group to confront the problems facing the local tourism industry. The association has taken an active role in the SAM Planning process and found that now they are part of a community and government forum that can focus on their needs and concerns. The ATBAHH has sponsored community awareness events, such as local "Shramadana" volunteer cleanups, public education programs for persons in the tourism sector and also hosted numerous informal teas for visiting officials.

Strategy 3 Promote cooperation between the community and tourism industry by building public awareness of the importance of tourism and by collaborating on community improvements.

- Actions**
1. Educate school children about the importance of tourism to the local economy and environment (CTB, Hoteliers, Schools).
 2. Establish education network between tourism, schools and social services about AIDS, drug abuse and prostitution (DS, PS, Hoteliers, Schools, NGO's).
 3. Sponsor small community improvements, such as trash cans, traffic signs, educational advertisements about the environment and shramadana cleanups (Hotel Association, CTB).
- Benefits**
- Improves image of tourism as a profession.
 - Raises public awareness about value of tourism.

5 Tourism Development and Livelihood Opportunities

Strategy 4 Provide a focus point for improving tourism by establishing a local CTB office in Hikkaduwa.

- Actions**
1. Develop plans for a tourist center to provide information services, act as a connection to Air Lanka travel reservation services, and serve as a clearing house for local accommodations (HSAM/MSCC, CTB, Hoteliers, Provincial Council).
 2. Send a formal letter of request to CTB (Hoteliers Association, HSAM/MSCC).
 3. Identify and develop a site for new Tourist Center (DS, CTB, Hoteliers)
 4. Develop a map and directory which lists tourist accommodations in Hikkaduwa and rates the quality of accommodations, health standards, and basic environmental practices such as waste disposal (CTB, PS, Hoteliers Associations) .
 5. Organize tourism training for local residents through this office (CTB, local tourist associations).

- Benefits**
- Tourists can easily compare establishments.
 - Establishments improve standards of accommodations.
 - Better access to travel services allows tourists to remain longer in Hikkaduwa.

Strategy 5 Establish a local Tourist Police Unit to improve security and resolve conflicts

- Actions**
1. Request Superintendent of Police, Galle to establish a special unit (HSAM/MSCC).
 2. Hoteliers can assist by providing informal training for selected police staff to build awareness about the concerns of tourists (Police, Hoteliers).
 3. Develop a group of skilled local people to serve as translators to assist tourists, police and local merchants (DS, Police, Schools).
 4. Obtain a boat and motor for police patrol (Police).

- Benefits**
- Police empathize with needs of hotels and tourists.
 - Facilitates negotiations for dispute resolution.
 - Improves security for residents, tourist and business.
 - Improves enforcement in the sanctuary.

PLAN IMPLEMENTATION

1.1 The Institutional Framework

Natural resource management experiences in developing countries have demonstrated that participation of local communities is vital for the success of such activities. Recognizing this, an increasing number of resource management activities are designed to involve local communities. The Hikkaduwa SAM plan enacts such policies to devolve responsibility to local authorities and community groups.

The Hikkaduwa SAM activities are coordinated by the Hikkaduwa Special Area Management/Marine Sanctuary Coordinating Committee (HSAM/MSCC). This is composed of central and local government officials and also representatives of key community groups. The committee has been entrusted with the task of coordinating all activities that impact on the sanctuary and the larger SAM site (Figure 6.1). The Committee's primary responsibility is to review and discuss all information regarding the SAM plan development and its implementation. The following is an agreed terms-of-reference for the HSAM/MSCC:

- Reviews, approves and/or amends the draft Hikkaduwa SAM plan
- Acts as a coordinating body for interagency planning and implementing of Hikkaduwa SAM activities
- Facilitates the monitoring and evaluating of SAM activities
- Develops policy guidelines specifically for the management of the Hikkaduwa Marine Sanctuary and surrounding areas
- Requests assistance from other government agencies as needed
- Facilitates community participation in the Hikkaduwa SAM planning and implementation process

Although the HSAM/MSCC is the coordinating entity in the SAM planning process, the SAM activities are actually implemented by various government agencies and non-government stakeholders. Successful implementation of the SAM Plan requires that the various stakeholders carry out specific tasks, most of which are activities that normally fall well within the routine responsibilities of their respective institutions (Figure 6.2).

6 Plan Implementation

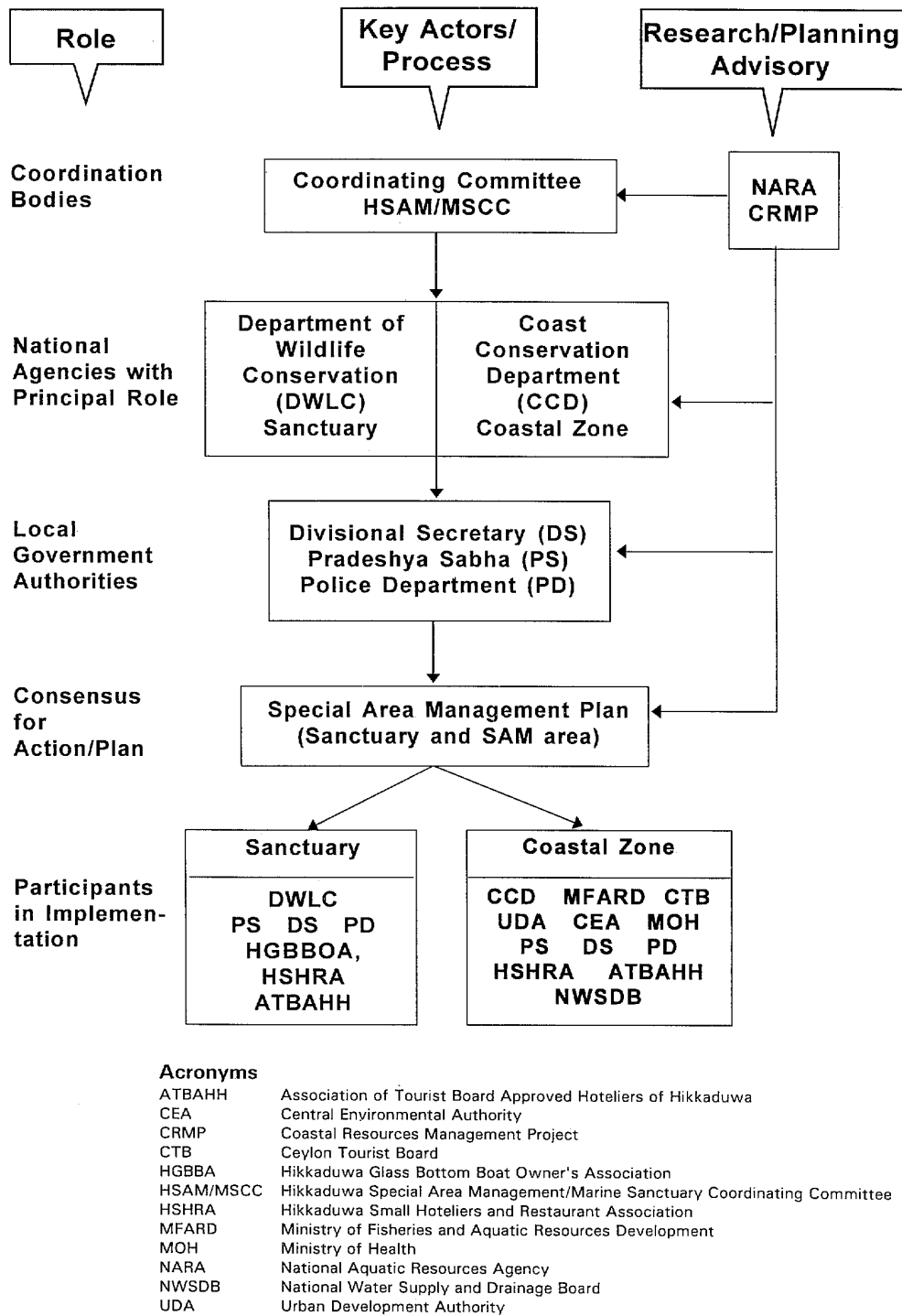


Figure 6.1 Institutional framework for planning and implementing the Hikkaduwa Special Area Management Plan

The key stakeholders are described below in three categories: national agencies, local government authorities and community resource user groups.

National Government Agencies

The National Coastal Zone Management Plan (CCD 1990), approved by the Cabinet of Ministers in 1990, provides the framework to manage resources in the coastal zone. Special Area Management planning, first proposed in Coastal 2000 was endorsed in 1994 by the Cabinet of Ministers.¹² The Revised CZM Plan of 1996 later authorized the development and implementation of SAM plans, such as for Hikkaduwa.⁵ CCD has the primary responsibility for management of coastal resources but the special nature of the Hikkaduwa SAM site requires major participation from DWLC and NARA also.

Coast Conservation Department (CCD) is responsible for formulating policy, implementing coastal protection and regulating development activities within the legal “coastal zone”. To successfully implement the SAM plan, CCD must actively participate in the SAM committee and continue to sponsor SAM planning activities. It must encourage the committee to view coastal development as an activity that impacts many different sectors and requires integrated planning and management.

Department of Wildlife Conservation (DWLC) manages the Hikkaduwa Marine Sanctuary under the Flora and Fauna Protection Act. DWLC has 1 assistant ranger and 3 guards assigned to sanctuary management. A senior Assistant Director works closely with the HSAM/MSCC. Successful management of the sanctuary requires DWLC to actively manage activities affecting the sanctuary through law enforcement, education and through policy making in a participatory and public manner.

National Aquatics Resources Agency (NARA) conducts and coordinates research and development activities, disseminates information and provides advisory and consultancy services for marine and inland aquatic resources management. NARA research officers have extensively studied the water quality and coral reef ecosystem in Hikkaduwa and repeatedly proposed management strategies for the area.^{6,8,9,11,13}

Other national agencies with significant responsibilities for implementing specific activities include:

Ministry of Fisheries and Aquatic Resources Development (MFARD) coordinates and monitors activities relevant to fisheries including formulating policy, recommending management plans, organizing cooperative

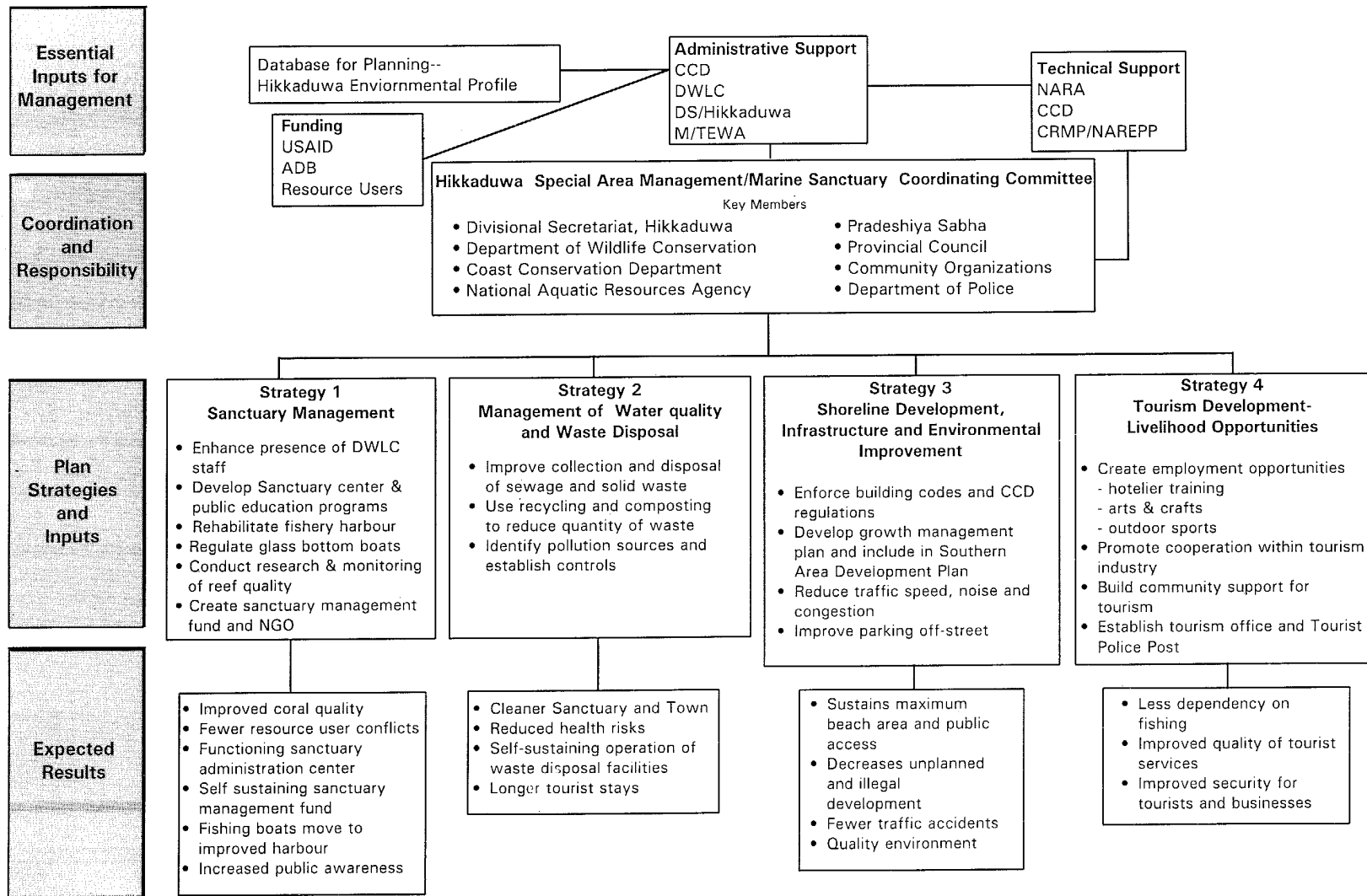


Figure 6.2 Management inputs, strategies and expected results for the Hikkaduwa special area management planning process

societies and implementing development projects. The Provincial Director of Fisheries, the District Fisheries Extension Officer and the District Fisheries Inspector have actively organized support for the SAM Plan within the fishing community and for rehabilitation of the fishery harbor by the Ceylon Fishery Harbors Corporation.

Ceylon Fishery Harbors Corporation (FHC) is responsible for the operation and maintenance of the Hikkaduwa Fishery Harbor. Renovation of the harbor by the FHC is scheduled to commence 1996. Once completed, the fishing boats must move their anchorage from the sanctuary to the improved harbor.

Ministry of Transport, Environment and Women's Affairs (MTEWA) formulates and coordinates environmental policy for planning and management. It also coordinates future donor funds for projects outlined in this plan and for other environmental projects.

Central Environmental Authority (CEA) within the MTEWA specifies standards, norms and criteria for environmental management, monitors environmental conditions, initiates research and disseminates information. It also serves as liaison for the Divisional Secretariat's Environmental Committee to address problems of water pollution, waste disposal and other local environmental issues.

Urban Development Authority (UDA), represented by the Town Planner, manages development within and outside of the coastal zone, including all designated "urban areas" within 1 km of the coast line. Parts of the UDA plan for Development of the Tourist Environment at Hikkaduwa (1987) are incorporated in this SAM plan.

Ceylon Tourist Board (CTB) promotes international tourism and formulates policies and guidelines which often affect coastal areas. CTB implements coastal tourist development projects and should direct development funds to assist the community and tourist industry of Hikkaduwa. CTB assistance is needed to establish a Tourism Information Center and to regularize tourism services, such as the tour guides, small guest-houses and restaurants.

Local Government Authorities

A general government policy is to devolve responsibility to local authorities. In the present administrative framework, the Divisional Secretariat is the unit of government best suited for this role in the Hikkaduwa SAM site.

6 Plan Implementation

Divisional Secretariat (DS) is the central government unit which implements the development projects of the Hikkaduwa Division and provides basic services to the inhabitants. This is the most suitable authority at the local level to administer the SAM planning process. The Divisional Secretary serves as the chairman of the Hikkaduwa Special Area Management and Marine Sanctuary Coordinating Committee. The office also provides clerical assistance to the HSAM/MSCC, sets agendas, calls meetings, and follows-up on decisions rendered by the committee.

Pradeshya Sabha (PS) is the body of locally elected officials who oversee the provision of local government services such as licensing vendors and businesses, collecting taxes, handling waste disposal and eliminating public nuisances. The PS must ensure that the glass-bottom boats are licensed and that garbage and sewage are properly disposed in an environmentally sound manner.

Police are vital for enforcement of civil and criminal law. They must work closely with the DWLC officers in order to protect property in the town and bio-diversity in the sanctuary.

Community-based Organizations (Resource User Groups)

There are a number of community-based organizations, cooperatives and trade associations that represent the resource users in the Hikkaduwa SAM process. The glass-bottom boats, formal hoteliers and the fishermen are represented by the most active associations.

Glass-bottom Boat Owners Association (GBBOA) protects the interests of the GBB industry. More than 40 boats are represented by this association. The GBBOA has been active in the HSAM/MSCC and is working in cooperation with DWLC to prevent damage to the sanctuary as a result of their activities. Licensing the boats to limit entry and organizing a queue for boat passengers will improve their operation. The GBBOA has offered to donate a portion of each passenger's fare towards a sanctuary Management Fund.

Association of Tourist Board- Approved Hotels of Hikkaduwa (ATBAHH) is a local trade organization that represents the 14 largest tourist hotels and restaurants in Hikkaduwa. The ATBAHH actively supports the efforts of the HSAM/MSCC to maintain a high quality environment that will sustain the local and international tourism trade of Hikkaduwa. The ATBAHH must make a real commitment to support the Pradeshya Sabha by paying for environmental amenities such as systems for sewage and solid waste (garbage) disposal. The ATBAHH also assists by providing opportunities for training and employment within the community.

Hikkaduwa Small Hotels and Restaurants Association (HSHRA) has the potential to represent approximately 40 smaller establishments within Hikkaduwa. Except for several individuals, they have not been active in the community or the planning process as an organization. This is regrettable since there are many small establishments which together comprise a large sector in Hikkaduwa's tourism industry and also contribute greatly to the problems of Hikkaduwa.

Tour Guides Association also has good potential as a trade organization but has not been active in the community or the planning process. There are more than 50 members but the leadership has been lacking in the group. Their participation is necessary if the quality of Hikkaduwa tour guides is to improve so that they provide a valuable service rather than merely serving as bothersome touts.

Fisheries Cooperative Society (FCS) was formed under the Department of Fisheries. The society has been actively soliciting the support of the Ministry of Fisheries and Aquatic Resources Development to rehabilitate the Fishery Harbor. Improved mooring capacity and shore facilities in the harbor would provide better services for fishing boats that presently must anchor in the sanctuary.

Hikkaduwa Multi-purpose Cooperative Society (MPCS) was established to help provide services, food stuffs and other commodities to the public. The facility is located in the coastal zone on the shore of the sanctuary. A portion of the MPCS land presently is used as vehicle parking for persons touring in glass bottom boats and for fishermen's beach access. It is proposed to obtain some of this land for an administrative office for DWLC officers and a visitor's educational center for the sanctuary. The site would provide public access, increase the number of patrons at the nearby MPCS Beer Garden Restaurant and also serve as a queuing point for loading glass bottom boats.

6.2 Summary of Objectives, Strategies and Actions

The earlier chapters of this plan presented numerous activities for implementation by different authorities and organizations. Table 6.1 summarizes the main contents of the management plan. Objectives, strategies and actions are organized by chapter and list the agency or community group with the primary responsibility for implementation. Priorities for implementation are noted (*) which pinpoint actions that already are being carried out through community and local government action.

6.3 Implementation Time-frame, Rationale and Funding

The time-frame for the implementation phase of the SAM plan is 5 years. The planning phase began in 1993, along with the implementation of some pilot projects. These initial implementation activities helped to achieve the broader management objectives and, more importantly, they provide incentive for community groups to participate. Because of the overlapping nature of planning and implementing, the implementation phase is ongoing. Table 6.1 shows the intended time-line for implementation of plan activities.

Funds for planning and initial implementing activities have been provided by the CRMP through CCD and the MTEWA's NAREP Project. Additional funds for implementation are being sought from the annual government budget and other sources. For example, the DWLC has budgeted four officers to manage the marine sanctuary and provided educational signs and swimming floats. The ATBAHH has conducted public awareness programs for local tourism employees. Funds for constructing larger public facilities may be available from external funding sources. For example, the Australian government may assist in the design and construction of a sewage treatment plant. The Asian Development Bank is supporting the Fisheries Development Project to renovate the Hikkaduwa Fisheries Harbor.

With these injections of external funding, Hikkaduwa still needs a method to sustainably pay for local management of the sanctuary and SAM site. The most feasible way is to recover some of the costs from the tourists visiting the town. A sanctuary management fund could be established to cover the expenses of operating the sanctuary. The fund would be supported by a local user fee collected from passengers in glass-bottom boats and through donations given by hotel guests. The fund would be managed by a local board of directors incorporated as an NGO with representation from the various government and user groups (Box 2.2).

Local fees must be collected specifically to cover the operation and maintenance costs for sewage and solid waste disposal even if donor funds are given for construction costs. The fee system should be structured in such a way that businesses can deduct them as costs rather than being assessed as taxes. Local business have indicated their willingness to pay for their share of these costs.

6.4 Summary

Recognition is growing in Sri Lanka about the need to involve local community groups in the management of natural resources. Awareness alone, however, is not enough to ensure that our local groups play a key role as equal partners. The Special Area Management (SAM) approach, if properly

facilitated, encourages local community groups to become active participants and to share in the benefits that result from our project activities. Participation by these interest groups together with local and central government agencies is the foundation of the Hikkaduwa SAM approach to planning and management. The key to the successful outcome is the integrity and dedication of the Hikkaduwa Special Area Management/ Marine Sanctuary Coordination Committee.

The Hikkaduwa SAM process and plan provide opportunities to reverse the negative environmental and socioeconomic trends caused by the lack of planning and management during the development of our local tourist industry. It is one of the first such efforts to be undertaken in Sri Lanka. In addition to the expected benefits obtained by improved management of Hikkaduwa's coastal resource area, this SAM process will provide valuable lessons for use by others in similar efforts elsewhere.

Table 6.1 Summary of objectives, strategies and actions for implementation of the Hikkaduwa Special Area Management Plan

Chapter 2. Sanctuary Management							
Objectives	1. Protect and improve the quality of the coral reef ecosystem and biodiversity in the Sanctuary 2. Develop a well trained and motivated sanctuary staff and provide them the necessary tools for law enforcement 3. Build community and public awareness 4. Elevate status and establish revenue source for management of sanctuary 5. Reduce damage to sanctuary from fishing and glass-bottom boats						
Strategy	Actions	'95	'96	'97	'98	'99	Responsibility
1. Increase the physical presence, patrolling and observation of DWLC personnel for educating sanctuary users and enforcing sanctuary regulations	1. Provide sanctuary office and education facility		○	○	○	○	DWLC
	2. Upgrade to nature reserve status with new boundaries		○				DWLC
	3. Train DWLC guards and police for joint patrols		○	○			DWLC, Police
	4. Develop watch schedule; conduct regular day/night watch of sanctuary		○	○	○	○	DWLC, Police
	5. Use sanctuary boat and surfboards to patrol		●	○	○	○	DWLC, CRMP
	6. Provide bright colored uniforms for DWLC		●	○	○	○	DWLC
	7. Conduct school contest for sanctuary logo and t-shirt design.		○				DWLC, DS
	8. Install "no standing" signs on reef		○				DWLC
	9. Conduct awareness programs for all reef users	●	○	○	○		DWLC
	10. Install and maintain swim floats	●	○	○	○	○	DWLC
	11. Gazette new boundaries and regulations		○	○	○	○	DWLC
	12. Place and maintain shore markers, research zone buoys and outer boundary buoys to make sanctuary boundary clear	●	○	○	○	○	DWLC, NARA
	13. Implement penalty fine system by DWLC			○			DWLC
	14. Construct 2 elevated guard stations on the beach for DWLC guards			○			DWLC
2. Develop an education program, Sanctuary visitors center and education facility jointly with the Cooperative Society, DWLC, NARA and CCD	1. Determine uses of the center and the area required	●	○				HSAM/MSCC
	2. Develop a business plan to estimate revenues/costs of Center		○				HSAM/MSCC
	3. Negotiate an agreement on use of Cooperative Society land		○				HSAM/MSCC, DWLC
	4. Obtain funds for design and construction plans		○				DWLC, GEF
	5. Prepare bid contract and supervise construction		○	○			DWLC, CCD
	6. Develop an education program based at visitor center		○	○	○	○	DWLC, NARA, CCD
	7. Assist management of the center by creating a non-governmental organization and Sanctuary Trust Fund from tourist fees		○	○	○	○	HSAM/MSCC
	8. Place road signs advertising: "Entering Hikkaduwa Marine Sanctuary - Help protect this national treasure"			○	○		HSAM/MSCC

- Ongoing or completed activities
- Proposed activities

Sanctuary Management (contd..)							
Strategy	Actions	'95	'96	'97	'98	'99	Responsibility
3. Rehabilitate the fishery harbor and move fishery boats out of the sanctuary	1. Inform MFARD about the strategies of the SAM plan and raise awareness of the urgency for rehabilitating the harbor	●	○				HSAM/MSCC
	2. Provide existing background information to MFARD	●	○				CRMP, CCD, DFEO
	3. Identify funding for implementing rehabilitation	●	○				HSAM/MSCC
	4. Strengthen Fisheries Cooperative Societies	●	○	○	○	○	DS, DWLC, MFARD
	5. Facilitate discussion on management of harbor facilities and assignment of mooring locations	●	○	○	○	○	DFEO, CRMP, MFARD
	6. Develop specifications for harbor and the shore facilities	●	○	○			DS, FCS
	7. Identify use for dredged material (filling old lime pits, widening road, leveling play field) and issue permits for removal of sand from Harbor		●				HC, MFARD, DFEO
	8. Transfer of fishing boats to harbor		○				DFEO
	9. Widen and mark narrow harbor channel for safety		○	○			CCD, CEA, DS
	10. Provide for collection and disposal of engine oil		○	○	○	○	DWLC, FCS, MFARD
4. Regulate the operation of glass bottom boats in the sanctuary through cooperation between Glass-bottom Boat Owners Association, DWLC and PS	1. Facilitate the formation of the GBB Owners Association	●	○				CRMP, DS
	2. Adopt regulations for boat operation		○				DWLC, PS, Police
	3. Limit the number of sanctuary permits given annually to 50 boats		○	○	○	○	DWLC, PS
	4. Conduct workshops for boat owners on regulations, coral reef ecosystem, boat/engine maintenance	●	○				CRMP, DWLC
	5. Assist the GBBOA to obtain training, group insurance		○	○			CRMP, HM
	6. Designate anchoring sites and loading area with dock facility		○	○	○	○	DWLC, NARA, GBBOA, CCD
	7. Adopt a queue and ticketing system for boats and passengers		○	○	○	○	DS, DWLC, PS, GBBOA
	8. Adopt a system to collect a small fee or donation from each passenger for sanctuary management		○	○	○	○	PS, GBBOA, DWLC
	9. Provide for collection and disposal of engine oil		○	○	○	○	GBBOA, HC
	10. Install 2 anchors and floats for GBB at Rocky Islets		○				DWLC, GBBOA, NARA
5. Develop and implement a research and monitoring plan for the sanctuary through collaboration of DWLC, NARA and universities	1. Provide linkage between monitoring and SAM planning	●	○	○	○	○	HSAM/MSCC, CCD
	2. Secure funding for water quality monitoring		○	○	○	○	DWLC, NARA
	3. Assign research and monitoring responsibilities	●	○	○			HSAM/MSCC
	4. Determine indicators and set schedule for monitoring		○	○			NARA
	5. Train DWLC staff and local volunteers to conduct monitoring		○	○	○	○	DWLC, NARA, CU
	6. Supervise and implement monitoring schedule for agreed indicators		○	○	○	○	NARA
	7. Experiment on coral settlement and artificial reef placement	●	○	○	○	○	NARA, CU

Chapter 3. Management of Water Quality and Waste Disposal

Objectives

1. Improve water and overall environmental quality in the SAM area
2. Eliminate raw or poorly treated wastewater entering the sanctuary
3. Eliminate trash and solid waste which accumulates in public areas and enters the sanctuary
4. Introduce fee system to pay for operations and maintenance of waste disposal

Strategy	Actions	'95	'96	'97	'98	'99	Responsibility
1. Develop and implement an appropriate solid waste disposal system through the Pradeshya Sabha with assistance from Galle municipality	<ol style="list-style-type: none"> 1. Facilitate discussion between PS and hoteliers 2. Conduct a study defining solid waste problem 3. Integrate composting and recycling with disposal 4. Collaborate with Galle MC to establish landfill site 5. Improve tax collection to pay for waste collection 6. Purchase and operate waste collection trucks 7. Implement a system to impose fines from violators 8. Conduct awareness campaign and encourage community groups to conduct clean-ups twice per year 9. Install trash bins along the beach and Galle Road; develop an effective collection method 	<ul style="list-style-type: none"> ● ● 	<ul style="list-style-type: none"> ○ ○ ○ ○ ○ ○ ○ ○ ○ 	<ul style="list-style-type: none"> ○ ○ ○ ○ ○ ○ ○ ○ ○ 	<ul style="list-style-type: none"> ○ ○ ○ ○ ○ ○ ○ ○ ○ 	<ul style="list-style-type: none"> ○ ○ ○ ○ ○ ○ ○ ○ ○ 	HSAM/MSCC CRMP Hotels, Coop Soc., PS, DS, CEA, MEIP, PS, DS PS, HSAM/MSCC PS PS, PHI, Police PS, NGO, DS, Hotels PS, Hotels
2. Develop a wastewater treatment system to service the tourist establishments and the town center	<ol style="list-style-type: none"> 1. Identify all sources of pollution 2. Establish contacts with private investors/ donors agencies for funds to construct the system 3. Update present plan to verify the design parameters 4. Implement sewers, waste treatment & monitoring system 5. Implement a fee system for paying operational costs 6. Provide technical assistance to improve septic systems 7. Purchase and maintain suction pump tank truck for removing septage from cess pools and septic tanks 8. Construct and maintain public toilets for sanctuary 	<ul style="list-style-type: none"> ● 	<ul style="list-style-type: none"> ○ ○ ○ ○ ○ ○ ○ ○ 	<ul style="list-style-type: none"> ○ ○ ○ ○ ○ ○ ○ ○ 	<ul style="list-style-type: none"> ○ ○ ○ ○ ○ ○ ○ ○ 	<ul style="list-style-type: none"> ○ ○ ○ ○ ○ ○ ○ ○ 	MOH, CEA, PHI, DS, GN HSAM/MSCC, CEA, CCD, NWSDB CEA, NWSDB CEA, NWSDB, PS, HSAM/MSCC CEA, MOH PS PS HSAM/MSCC, PS
3. Reduce the entry of pollutants and sediments into the sanctuary and the surrounding sea by identifying all sources and establishing controls	<ol style="list-style-type: none"> 1. Educate public, hotels, restaurants, GBB and fish boat operators about waste disposal 2. Move fishing boats out of the sanctuary 3. Develop and implement waste oil disposal system at harbor 4. Extend & redirect highway drains away from Sanctuary 5. Identify sources of pollutants discharging to canals; reduce discharges by education and enforcement 6. Control land use and construction in the canal basins to reduce pollution and sediment loss 7. Coordinate cleaning or dredging of canals to occur during dry season to minimize flow of sediment to sanctuary 8. Coordinate water sampling of canals and marine waters 	<ul style="list-style-type: none"> ● 	<ul style="list-style-type: none"> ○ ○ ○ ○ ○ ○ ○ ○ 	<ul style="list-style-type: none"> ○ ○ ○ ○ ○ ○ ○ ○ 	<ul style="list-style-type: none"> ○ ○ ○ ○ ○ ○ ○ ○ 	<ul style="list-style-type: none"> ○ ○ ○ ○ ○ ○ ○ ○ 	DFEO, HSAM/MSCC DWLC, MFARD, FCS, CEA HC, FCS, PS, DFEO, FCS RDA, HSAM/MSCC, CCD MOH, PHI, DS, GN, NARA UDA, DS, PS, PHI DS, PS, PHI, UDA NARA, CEA

Chapter 4. Shoreline Development, Infrastructure and Environmental Improvements							
Objectives	1. Maximize beach area and public access 2. Control unregulated or illegal planned construction and development in SAM area 3. Reduce traffic speed and noise pollution to make Hikkaduwa a more pleasant and safe place						
Strategy	Actions	'95	'96	'97	'98	'99	Responsibility
1. Enforce building regulations and CCD setback requirements in the coastal strip throughout SAM area	1. Provide one officer in Hikkaduwa to assist with planning, enforce regulations and serve as local environmental staff in DS office. 2. Determine setback and building requirements 3. Monitor all building activity and require permits 4. Identify all beach public access points and acquire the land 5. Deny permits for reconstruction of older structures encroaching on public access beyond current setbacks 6. Adopt and enforce fines against new violations of setbacks; require removal of new illegal structures 7. Encourage soft stabilization techniques to prevent erosion 8. Use sand reserves in harbor for beach nourishment after proper study 9. Monitor and stop all sand mining in SAM beaches	●	○	○	○	○	DS, CCD, CRMP, MTEWA CCD, DS CCD, DS, CCD DS, PS CCD, DS, PS CCD, DS, PS CCD CCD, NARA, DS, Hotels CCD, DS
2. Develop a growth management plan for Hikkaduwa to prevent uncontrolled construction and development	1. Update 1987 UDA plan for development of tourist environment at Hikkaduwa and obtain approval of Cabinet Sub-committee 2. Enforce CZM Plan guidelines for development 3. Study oceanographic patterns and sediment movement 4. Include Hikkaduwa SAM Plan within the proposed Southern Area Development Plan	●	○	○	○	○	HSAM/MSCC, UDA CCD, DS NARA HSAM/MSCC
3. Reduce traffic speed, noise and congestion through enforced compliance, fines and traffic/parking controls	1. Meet with police to encourage them to enforce laws and issue fines 2. Authorize higher fines for reckless and speeding vehicles 3. Install electric warning signs along Galle Road 4. Reduce speed-limit to 40 km/hour and install more speed-limit signs & no-passing lines with ridges (or road divider) 5. Follow up UDA proposal for a by-pass road 6. Develop off-street parking site for town center 7. Develop sidewalks for town center along Galle Road	●	○	○	○	○	HSAM/MSCC, Police PS, Police Hoteliers RDA RDA, UDA RDA, PS, DS RDA, PS, DS

Chapter 5 Tourism Development and Livelihood Opportunities

Objectives

1. Develop new tourism related livelihoods for employment of local youth
2. Improve the quality of local tour guide services
3. Improve relations and cooperation between formal and informal tourism sectors

Strategy	Actions	'95	'96	'97	'98	'99	Responsibility
1. Create employment opportunities for local youth, tourist guides and touts through several pilot projects	1. Conduct feasibility studies on employment by tourist activities such as bird watching, sport fishing, boating, sailing and other small businesses		○	○			CTB, Guide Assoc., Hoteliers
	2. Conduct training for tour guides and touts in the art of public relations and tour guiding		○	○			CTB, Guide Assoc.
	3. Link with the folk art center in Bentota for traditional crafts training		○	○	○	○	Min. Tourism, Provincial Council
	4. Establish basic level hoteliers training course in Hikkaduwa		○	○	○	○	CTB, Hotels
	5. Provide entry-level intern positions for hoteliers students		○	○	○	○	CTB, Hotels
2. Promote cooperation between the informal and formal tourism business sectors	1. Give full representation to all tourism associations in the HSAM/MSCC	●	○	○	○	○	HSAM/MSCC
	2. Set up a new tourist association with both formal and informal operators to discuss mutual concerns		○	○	○		HSAM/MSCC, Hotels
	3. Provide training for informal sector operators		○	○	○	○	CTB
	4. Regularize tour guide licenses and increase enforcement		○	○	○	○	PS, CTB
	5. Control activities of beach vendors by licensing		○	○	○	○	PS, PHI
3. Promote cooperation between the community and tourism industry	1. Educate school children about importance of tourism to local economy and environment		○	○	○	○	Schools, DS, Hotels
	2. Establish education network between tourism, schools and social services about AIDS, drug abuse and prostitution		○	○	○	○	DS, PS, Schools
	3. Sponsor small community improvements		○	○	○	○	Hotels, NGO's Hotels, CTB
4. Establish CTB office in Hikkaduwa	1. Develop plans for Tourist Center to provide tourist information services, Air Lanka reservation services, clearing house for local accommodations		○	○			HSAM/MSCC, CTB, Provincial Council
	2. Letter of request to CTB		○				Hotels, HSAM/MSCC
	3. Identify site for Tourist Office		○				CTB, DS, Hotels
	4. Develop a directory for all Hikkaduwa tourist establishments which ranks health, accommodations and environment.		○	○			CTB, PS, Hotels
	5. Provide information and tourism training through this office		○	○	○	○	Hotels, CTB
5. Establish Tourist Police Unit	1. Letter of request to SP-Galle to establish special unit		○				HSAM/MSCC
	2. Provide informal training of selected police staff by hoteliers		○	○	○	○	Police, Hotels
	3. Develop group of skilled local people to serve as translators		○	○	○	○	DS, Police, Schools
	4. Obtain boat and motor for police patrol		○	○	○	○	Police

- Ongoing or completed activities
- Proposed activities

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වනජීවී සංරක්ෂණ දෙපාර්තමේන්තුවේ
සහ

වෙරළ සම්පත් කළමනාකරණ ව්‍යාපෘතියේ
සහාය ඇතිව

හික්කඩුව විශේෂ කළමනාකරණ ප්‍රදේශ / සමුද්‍ර අභයභූමි සම්බන්ධීකරණ කමිටුව
විසින්

පසුබිම

කොළඹ සිට කිලෝමීටර 100ක් පමණ දකුණෙන් ගාලු දිස්ත්‍රික්කයේ වෙරළ අසබඩ පිහිටි රමණිය ධීවර නගරයකි හික්කඩුව. පසුගිය අවුරුදු 25ක පමණ කාලයක් තුළ හික්කඩුව ශ්‍රී ලංකාවේ ඉතා ජනප්‍රිය සංචාරක පෙදෙසක් ලෙස ප්‍රසිද්ධියට පත් විය. දස දහස් ගණන් විදේශ සංචාරකයන් හික්කඩුවට ඇදී එන්නේ මෙහි ඇති මනරම් මුහුදු වෙරළ, අලංකාර හිරිගල් පර සහ ඒවායේ වෙසෙන විචිත්‍ර මසුන් ආදිය නිසා ය. හික්කඩුව මුහුදු ප්‍රදේශය අභයභූමියක් ලෙස 1979 දී ප්‍රකාශයට පත් කරන ලදී.

වෙනත් වෙරළබඩ පෙදෙස්වල මෙන් ම හික්කඩුවේ ද ධීවර කර්මාන්තය අහිමිවන සංචාරක ව්‍යාපාරය ඉස්මතු විය. 1992 වර්ෂයේ දී විදේශ සංචාරකයන් එහි ගත කළ සංචාරක රාත්‍රි ප්‍රමාණය 290,000කි. මේ විදේශ සංචාරකයන් නිසා රුපියල් කෝටි 103.6ක් රටේ ආර්ථිකයට එක් කෙරිණි.¹⁶

අවාසනාවකට මෙන් සංචාරක ව්‍යාපාරය නිසා හොඳ ප්‍රතිඵල මෙන් ම පරිසරයට අහිතකර ප්‍රතිඵල ද හට ගති. මේ අහිතකර ප්‍රතිඵලවලින් සමහරක් නම් අපේ හිරිගල් පද්ධතිය විනාශ වීමත්, වෙරළබඩ ප්‍රදේශයේ ගුණාත්මක තත්ත්වය හීන වීමත්, රට්වාහන තදබදයත්, ඒ නිසා ඇතිවන ශබ්ද දූෂණයත්, සංචාරක ව්‍යාපාර සහ ධීවර කර්මාන්තය අතර ගැටුම් ඇතිවීමත්, මත් ද්‍රව්‍යවලට ඇබ්බැහි වූවන්ගේ සහ ගණිකා වෘත්තියේ යෙදෙන්නන්ගේ ප්‍රමාණය වර්ධනය වීමත් ය. හික්කඩුව කෙරෙහි විදේශ සංචාරකයන්ගේ ප්‍රියතාව අඩුවීමට මේ අහිතකර තත්ත්ව හේතු වී ඇත.

හික්කඩුවේ අද ක්‍රියාත්මක වන විශේෂ ප්‍රදේශ කළමනාකරණ (විප්‍රක) සැලසුම, දැනට ඉස්මතු වී ඇති ඉහත කී ගැටලු සහ බාධක විසඳීම සඳහා දියත් කරන ලද ප්‍රයත්නයකි. මේ සැලසුම හික්කඩුවේ ප්‍රජාව හා රජයේ විවිධ නියෝජිතයන්ගෙන් ද එක් ව ප්‍රජාමුඛ වැයමක ප්‍රතිඵලයක් වේ. මෙහි මූලික අරමුණ නම් හික්කඩුවේ සමුද්‍රීය සහ වෙරළබඩ සම්පත් පවත්වාගෙන යා හැකි වන පරිදි කළමනාකරණය යි. වෙරළබඩ කළමනාකරණ ප්‍රතිපත්තිවල ඉතිහාසයෙන් බිඳක් ද සැලසුම පිළියෙළ කිරීමට ඇති අවශ්‍යතාව සැකෙවින් ද මේ සැලසුමෙහි සඳහන් කර තිබේ.

හික්කඩුවේ ඉස්මතු වී ඇති ගැටලු විසඳීම සඳහා මහජන රැස්වීම්වල දී එකඟතාවකට පැමිණි ප්‍රතිපත්ති සහ ක්‍රමෝපාය මේ සැලසුම විසින් ඉදිරිපත් කෙරේ. එමෙන් ම සැලසුම මගින් එකී ප්‍රධාන ගැටලු විශ්ලේෂණය කරන්නේ ය.

මේ සැලසුම ක්‍රියාත්මක කිරීම සහ සම්බන්ධීකරණය සඳහා ප්‍රාදේශීය වශයෙන් පිහිටුවන ලද යාන්ත්‍රණය ලෙස හික්කඩුව විශේෂ කළමනාකරණ ප්‍රදේශ / සමුද්‍රීය අභයභූමි සම්බන්ධීකරණ කමිටුව (හිවීසස) සැලකිය හැකි ය. මේ සැලසුම යනු දැනට සහ අනාගතයේ වෙනස් වන ප්‍රජා ගැටලු විසඳීමට හැකිවන ලෙස ගතිකත්වයෙන් යුතු පිවමාන ක්‍රියාවලියකි. එමෙන් ම මේ සැලසුම මගින් ශ්‍රී ලංකාවේ සමස්ත මුහුදු තීරය ඔස්සේ මෙවැනි ම තත්ත්ව උද්ගත වුණු බොහෝ ස්ථානවල කටයුතු කරන පුද්ගලයන්ට මග පෙන්වීමක් කෙරෙනු ඇත.

හික්කඩුවේ ඉස්මතු වූ කළමනාකරණ ගැටලු

කමිටුවේ පසුගිය රැස්වීම්වල දී ද ජන කණ්ඩායම් සමග පැවැත්වූ රැස්වීම්වල දී ද නොයෙක් ගැටලු වරින් වර ඉස්මතු විය. මේ විවිධ ගැටලු අතර සම්බන්ධතාවක් තිබෙනු පමණක් නොව ඒවා නොයෙක් කණ්ඩායම්වලට ද බලපානු ලැබේ. හිරිගල් කැඩීම එක් නිදසුනක් ලෙස ගත හැකි ය. හිරිගල් කැඩීමට එක් හේතුවක් නම් දැනට සමුද්‍රීය අභයභූමිය තුළ නවතා ඇති ධීවර යාත්‍රා ය. මේවා සුරක්ෂිත ලෙස නවතා තැබීමට ධීවර වරායක් නොමැති කම තවත් ගැටලුවකි. මේවා ගැටලු දෙකක් ලෙස ප්‍රකාශ කර ඇතත් මෙහි සම්බන්ධතාව පැහැදිලි ය. එක් පොදු විසඳීමක් මගින් විවිධ කණ්ඩායම්වලට මුහුණ පෑමට සිදු වී ඇති ප්‍රශ්න සමථයකට පත් කළ හැකි ය. හික්කඩුවේ ඉස්මතු වූ ගැටලු සවිස්තර ව හික්කඩුවේ වෙරළබඩ පාරිසරික පැතිකඩ¹¹ නමැති කෘතියේ ඇතුළත් කර ඇත. ඒ ගැටලුවල සාරාංශයක් පහත සටහනෙන් දැක් වේ.

හික්කඩුව විශේෂ කළමනාකරණ ප්‍රදේශයේ ඉස්මතු වූ ගැටලු

හික්කඩුව සමුද්‍ර අභයභූමි සම්පත් පිරිහියාම

- හිරිගල් පර පිරිහීම
- ධීවර යාත්‍රා නැංගුරම් ලැමට සහ මසුන් ගොඩ බැමට පහසුකම් නොමැතිකම
- ධීවර වරායට පිවිසීමේ ඇති දුෂ්කරතා
- ගල්පර මසුන් කෙමෙන් අඩු වීම
- මසුන් ඇල්ලීමේ නීති විරෝධී ක්‍රම භාවිතය

ජලයේ ගුණය සහ කසළ බැහැර කිරීම

- වෙරළබඩ ජලයේ ගුණය පිරිහීම
- කසළ බැහැර කිරීම පිළිබඳ ව ඇති දුර්වලතා
- හෝටලවලින් පිටවන කසළ ජලය නිසා භූගත ජලය සහ වෙරළබඩ ජලය අපවිත්‍ර වීම
- ඝන කසළ බැහැර කිරීම සඳහා ඇති පහසුකම් ප්‍රමාණවත් නො වීම
- පානීය ජල සැපයුම ප්‍රමාණවත් නො වීම

මුහුදු තීරයේ සහ ජන සමාජයේ ගතිලක්ෂණ

- රථවාහනවල ධාවන වේගයේ අධික බව, ශබ්ද දූෂණය සහ තදබදය
- ක්‍රමයෙන් වැඩිවන වෙරළ තදබදය සහ සමුද්‍ර අභයභූමියේ පරිහරණ සීමා ඉක්ම වීම
- නීති විරෝධී ලෙස මුහුදු වෙරළේ ගොඩනැගිලි ඉදිකිරීම

සංචාරක ව්‍යාපාරයේ බලපෑම් සහ ජීවනෝපා ඉඩප්‍රස්තාවල අවශ්‍යතාව

- වෙනත් රැකියා සහ ජීවනෝපාමාර්ග නැතිකම
- සංචාරකයන් උදෙසා වර්ධනය වී ඇති අවිධිමත් සේවා අතර සම්බන්ධතාවක් නොමැති වීම
- කරදරකාරී තැරැවිකරුවන්ගෙන් සංචාරකයන්ට ඇතිවන හිරිහැර සහ දුෂ්කරතා
- ප්‍රදේශය තුළ ගණිකාවන් සහ මත් උව්‍ය පහසුවෙන් ලබාගත හැකි බව ප්‍රසිද්ධ වීම සහ එමගින් අනිසි ක්‍රියාකාරකම් බහුල වීම.

සැලසුමේ අරමුණු සහ පරමාර්ථ

ඉහත සඳහන් ගැටලු විසඳ ගැනීම සඳහා විප්‍රක සැලසුමේ පහත දැක්වෙන අරමුණ සාක්ෂාත් කර ගැනීමට කමිටුව සහාය වනු ඇත.

වෙරළබඩ සම්පත්වල ජීව විවිධත්වයෙන් සහ සාමාන්‍ය පාරිසරික ගුණයෙන් ප්‍රජාවට දිගට ම සුබසෙන සැලසෙන පරිදින්, එමගින් ප්‍රදේශයේ සංචාරක ව්‍යාපාරය ද, ධීවර කර්මාන්තය ද තිරසාර ව පැවතිය හැකි වන පරිදින් හික්කඩුවේ වෙරළබඩ සම්පත් ආරක්ෂාව සහ කළමනාකරණය

කමිටුව එකඟ වූ මේ අරමුණ සපුරා ගැනීම සඳහා පහත සඳහන් පරමාර්ථ මගින් විප්‍රක සැලසුමේ ප්‍රතිපත්ති සැදී ඇත.

මේ පරමාර්ථ නම්.

1. හිරිගල් පර කැඩීම වැළැක්වීමෙන් ද, වෙරළබඩ ප්ලයේ ගුණය වර්ධනය කිරීමෙන් ද, හිරිගල් පරවල වෙසෙන මත්ස්‍ය ගහනය වර්ධනය කිරීමෙන් ද හික්කඩුව සමුද්‍ර අභයභූමිය තුළ සහ ඒ අවට පෞද්ගල ඉක්බිතිවල ඉක්බිති භාවය වර්ධනය කිරීම.
2. ප්‍රජාව දැනුමැති කිරීම මගින් ද, සැලසුම් කටයුතුවල දී සහභාගිත්වය වර්ධනය කිරීමෙන් ද, විප්‍රක සැලසුම් කටයුතු සඳහා ආයතනික සහ නෛතික සහාය වැඩි දියුණු කිරීමෙන් ද ඒකාබද්ධ ලෙස සහ හිරිසාර අයුරින් වෙරළ සම්පත් කළමනාකරණ හැකියාව, ප්‍රජාව තුළ වර්ධනය කිරීම.
3. සංචාරක ව්‍යාපාරයේ සහ ධීවර කර්මාන්තයේ හිරිසාර මට්ටම් අනුව පදනම් වූ මනා ප්‍රාදේශීය ආර්ථිකයක් දිරිමත් කිරීම මගින් ප්‍රාදේශීය සහ ජාතික වශයෙන් ප්‍රතිලාභ වැඩි කිරීම.
4. කසළ ඉවත් කිරීම, ජල සම්පාදනය, ප්‍රවාහණය යනාදියේ මූලික පහසුකම් දියුණු කිරීමෙන් සහ ඉඩම් පරිහරණය සැලසුම් කිරීමෙන් ප්‍රජාවගේ පාරිසරික ගුණාත්මක තත්ත්වය වර්ධනය කිරීම.

කළමනාකරණ අවශ්‍යතාව සඳහා වූ සාධක

බොහෝ පුද්ගලයන් සහ කණ්ඩායම් මගින් විවිධ ගැටලු සහ බාධක ඉස්මතු කිරීම නිසා හික්කඩුවේ ස්වාභාවික සම්පත් සහ වෙරළබඩ කර්මාන්ත සුක්ෂම ලෙස කළමනාකරණයේ අවශ්‍යතාව දැන් ඉස්මතු වී පෙනී යාමට පටන් ගෙන ඇත. ජීව විවිධත්වයේ සහ හිරිගල් පරයේ තත්ත්වය පිරිහීම, ජාතික ජලජ සම්පත් නියෝජිතයන්ගේ පර්යේෂකයන් දැඩි ලෙස අවධාරණය කර තිබේ. විදුරු පතුලැති යාත්‍රා ක්‍රියාකරුවන්ගේ සමුද්‍ර අභයභූමියේ යාත්‍රා බහුල වීම ගැන පැමිණිලි කරති. යාත්‍රාවලින් පිටදමන තෙල් අපද්‍රව්‍ය නිසා ඇතිවන දූෂණය පිළිබඳ ව පිහිනුම්කරුවෝ වෝදනා නගත්, හෝටලවලින් මුහුදට දමන අසූචි අපද්‍රව්‍ය නිසා මසුන් ප්‍රමාණය අඩු වී ඇති බව ධීවරයෝ පවසති. මහා මාර්ගයේ ඇවිදීමට සංචාරකයන් මැලිවන්නේ වේගයෙන් ධාවනය කරන මෝටර් වාහන නිසාත්, කරදරකාරී තැරැවිකරුවන් නිසාත් ය. යුරෝපීය සංචාරක වැඩසටහන්වලට හික්කඩුව ඇතුළත් කර නැති නිසා හෝටල හිමියෝ දුක් වෙති. මෙසේ ගැටලු මාලාව සීමාරහිත ය. හික්කඩුවේ ඇති ගැටලුන් පරිසරයේ සහ ස්වාභාවික සම්පත්වල පරිහානියත් ප්‍රදේශයේ ආර්ථික තත්ත්වය දුර්වල වීමට හේතු විය හැකි ය.

හික්කඩුවේ සංචාරක කර්මාන්තය නිසා ව්‍යාපාරවලින් ලැබෙන ලාභ, වැඩි වැටුප් සහිත රැකියා සහ විදේශ විනිමය ඉපැයුම් වැනි ආර්ථික ප්‍රතිලාභ අත්වී තිබේ. 1992 දී හික්කඩුවට ලැබුණු ශුද්ධ සෘජු ආර්ථික ප්‍රතිලාභ ප්‍රමාණය රුපියල් කෝටි 10.9ක් පමණ ය. වකු ව ලැබුණු ආදායම රුපියල් කෝටි 92.5ක් පමණ වේ. මේ ආර්ථික පදනම නිසා ප්‍රදේශයේ පුද්ගලයන් 3500කට පමණ රැකියා ලැබී තිබේ.¹⁶

අනාගතයේ දී සංචාරක ව්‍යාපාරයේ ප්‍රතිලාභ සහ පාරිසරික ගුණාත්මක භාවය අතර ඇති සම්බන්ධය තත්ත්වය සහ වයිට්¹⁶ විසින් අධ්‍යයනය කරනු ලැබ ඇත. මෙහි දී ඔවුහු ආදායම් මාදිලි දෙකක් සලකා බැලූහ. එක් මාදිලියක් නම් දැන් පවතින ක්‍රියාකාරීත්වයේ කිසිදු වෙනසක් නොකිරීම සහ හිරිසාර නොවූ සම්පත් පරිහරණය යි. දෙවැනි මාදිලියට පොදු පහසුකම් වැඩි දියුණු කිරීම සහ නිසි ලෙස සම්පත් කළමනාකරණය ඇතුළත් වීණි.

මෙහි 12වැනි පිටුවේ දැක්වෙන 14 වැනි රූපයෙන් මේ මාදිලි දෙක ද ඒවායේ ඵලය වූ වාර්ෂික ප්‍රතිලාභවල ඇස්තමේන්තු ද පෙන්නුම් කෙරේ. හිරිසාර නොවූ කළමනාකරණයක් සහිත මාදිලිය මගින් ප්‍රදේශයට පැමිණි සංචාරකයන් ගණනින් අඩුවීමක් දක්වන අතර ඒ නිසා ඉදිරි දස වසර තුළ සංචාරක ව්‍යාපාරයේ ආදායම් පහත බැසීමක් සිදු වේ. දෙවැනි මාදිලියෙන් පෙන්නුම් කරන්නේ පාරිසරික කළමනාකරණය සහ පොදු පහසුකම් සඳහා දැන් සිට ම ස්ථිර ආයෝජනයක් කිරීම මගින් සංචාරකයන් පැමිණීමේ වර්ධනයක් බලාපොරොත්තු විය හැකි බව යි. ඉදිරි දස වසර තුළ හික්කඩුවේ සමස්ත සහ ශුද්ධ ආදායම් වැඩිවීම එහි ප්‍රතිඵලය වේ.

මේ අධ්‍යයනයේ නිගමනය වූයේ පාරිසරික ගුණාත්මක භාවය වැඩිදියුණු කිරීමෙන් සැලසෙන ප්‍රතිලාභ

ප්‍රමාණය, පරිසරය දැන් තිබෙන තත්ත්වයෙන් ම ගෙන යාමෙන් සැලසෙන ප්‍රතිලාභවලට ඉතා වැඩි බව යි. ඒ නිසා සමුද්‍ර අභයභූමිය නිසි ලෙස කළමනාකරණයෙන්, සමුද්‍ර ජලය පවිත්‍ර ව තබා ගැනීමෙන්, කසළ ජලය සහ ඝන කසළ නිසි ලෙස බැහැර කිරීමෙන්, ධීවර වරාය, මංමාවත් සහ පියමං යනාදී පොදු පහසුකම් දියුණු කිරීමෙන් දැන් ලැබෙන ආදායමට වඩා විශාල ආදායමක් ලබා ගත හැකි ය. මේ අධ්‍යයනයෙන් පෙන්වුම් කළ තවත් කරුණක් නම් පරිසර සංරක්ෂණයට වැයවන මුදල්, ප්‍රදේශයට ලැබිය හැකි ආදායමෙන් ඉතා සුළු ප්‍රමාණයක් පමණක් බව යි. විශ්ලේෂණයේ දී එළැඹුණු තවත් නිගමනයක් වන්නේ දේශීය සම්පත් කළමනාකරණයට වැය කිරීම සඳහා දේශීය සංචාරකයන්ගෙන් සංචාරක ගාස්තුවක් හෝ ලාභාංශ බද්දක් හෝ අය කිරීම සුදුසු බව ය.

දැනට හික්කඩුවේ තිබෙන ගැටලු සහ බාධක ගැන ද මතුවට ඇතිවිය හැකි ආර්ථික බලපෑම් යනාදී සියලු කරුණු ද සලකා බැලීමේ දී හික්කඩුව පෙදෙසට කළමනාකරණ සැලසුමක් අවශ්‍ය බව ඒත්තු යනවා ඇත. ප්‍රජාවගේ සහභාගිත්වයෙන් පිළියෙළ කරන ලද මේ සැලසුම ක්‍රියාත්මක කිරීමට සියල්ලන්ගේ ම සහභාගිත්වය සහ සහයෝගය නොලැබුණොත් එහි ප්‍රතිඵලය වන්නේ ස්වාභාවික සම්පත් විනාශ වී යාමත් ප්‍රදේශයේ ආර්ථික තත්ත්වය හීන වීමත් ය. ප්‍රදේශයේ ප්‍රජා සංවිධාන, රජයේ නිලධාරීන්, පෞද්ගලික අංශයේ නියුතු වූවන් සහ පුරවැසියන් ස්වකීය කාලයන් පරිලාභයන් කළමනාකරණ සැලසුමක් සකස් කිරීමට සහ ක්‍රියාත්මක කිරීමට යෙදවීම වාසනාවකි. මොවුන් ඒ කාර්යය කිරීමට ඉදිරිපත් වී ඇත්තේ සාමූහික කැපවීමකිනි.

සැලසුම සංවිධාන කිරීම සහ ක්‍රියාත්මක කිරීම

හික්කඩුවේ විශේෂ ප්‍රදේශ කළමනාකරණ සැලසුම මගින් ප්‍රදේශයේ ගැටලු සහ බාධක විශ්ලේෂණය කර ඒවා නිරාකරණය කිරීමට ක්‍රියා මාර්ග ඉදිරිපත් කෙරේ. මේ සැලසුමේ 1 වැනි පරිච්ඡේදය වූ හැඳින්වීමට එක්කර ඇති පසුබිම් තොරතුරු ලබා ගන්නා ලද්දේ “නික්කඩුවේ වෙරළබඩ පාරිසරික පැතිකඩ” කෘතියෙනි. සැලසුමේ 2 වැනි පරිච්ඡේදයේ හික්කඩුව සමුද්‍ර අභයභූමි සම්පත් කළමනාකරණය පිළිබඳ ව ද 3 වැනි පරිච්ඡේදයේ ඝන කසළ සහ කසළ ජලය බැහැර කිරීම පිළිබඳ ව ද සාකච්ඡා කරයි. 4 වැනි පරිච්ඡේදයේ විශේෂයෙන් සඳහන් වන්නේ වෙරළබඩ පරිසරයේ සාමාන්‍ය ලක්ෂණ සහ රටවහන උවදුරු වැළැක්වීමට කරන යෝජනා පිළිබඳ ව යි. සංචාරක ව්‍යාපාරයේ බලපෑම් සහ විකල්ප රැකිරීම සඳහා ඇතිකිරීමේ හැකියාව පිළිබඳ ව විස්තර වන්නේ 5 වැනි පරිච්ඡේදයෙනි. අවසාන වශයෙන් සැලසුම් ක්‍රියාත්මක කිරීමේ වැඩපිළිවෙළ පාලනය කිරීම ද සම්බන්ධීකරණය ද සිදු කළ යුත්තේ කෙසේ දැයි 6 වැනි පරිච්ඡේදයෙන් පැහැදිලි කෙරේ.

සැලසුමේ 2 සිට 5 දක්වා වූ පරිච්ඡේදවල අන්තර්ගත වූ අරමුණු, ක්‍රමෝපාය සහ ක්‍රියාකාරකම්වල සාරාංශයක් මෙහි ඇති 6.1 වැනි වගුවේ ඉදිරිපත් කර ඇත. ක්‍රියාත්මක කිරීමේ වැඩසටහන් සහ ඒ කාර්යයන් ක්‍රියාත්මක කිරීමේ දී වගකිවයුත්තන් පිළිබඳ ව මේ වගුවේ තොරතුරු දක්වා තිබේ. මේ විවිධ කටයුතු ගැන සුපරීක්ෂාකාරී ව විමසා බැලීම කමිටුවේ සාමාජිකයන්ගේ කාර්ය වන්නේ ය. මේ පිළිබඳව දීර්ඝ සාකච්ඡා සහ විශ්ලේෂණ යනාදිය මෙකී සැලසුමේ අන්තර්ගත වී ඇත.

මේ සැලසුම මගින් පෙන්වා දෙන සංවර්ධනය සඳහා ප්‍රජා මට්ටමේ සහභාගිත්වය අවශ්‍ය ම ය. මේ සඳහා විදුරු පතුලැහි යාත්‍රාකරුවන්, හෝටල හිමියන්, අවන්හල් හිමියන් සහ ධීවරයන් යනාදීන් සමග නොයෙක් වර සාකච්ඡා, රැස්වීම්, සම්මන්ත්‍රණ සංවිධානය කිරීමට අවශ්‍ය වනු ඇත. තව ද පළාත් පාලන නිලධාරීන් සහ හික්කඩුවේ කටයුතු පිළිබඳ වගකීම් දරන ජාතික මට්ටමේ නියෝජිතයන් ද ඊට අයත් වන්නේ ය. මේ සැලසුම ක්‍රියාත්මක කිරීම සඳහා කළ යුතු කාර්යයන් පිළිබඳ වගකිවයුතු සියල්ලන් ප්‍රතිපත්ති වශයෙන් එකගත්වයකට පැමිණිය යුතු ය. එමෙන් ම ඒ කාර්යයන් ක්‍රියාත්මක කිරීමට විවිධ පාර්ශවයන් කැපවීමකින් වගකීම් බාරගත යුතු ය. අපගේ වැයමේ සාර්ථකත්වය රඳ පවතින්නේ කමිටුවත්, එහි විවිධ හවුල්කරුවන්ත්, ප්‍රජාව සහ රජයත් යන සියල්ලන්ගේ ම සහයෝගීතාව අනුව ය.

□

සංකීර්ණ

කොච්ච	- කොළඹ විශ්වවිද්‍යාලය	මසප	- මහජන සෞඛ්‍ය පරීක්ෂක
කොළඹ	- කොළඹ පරිසර ප්‍රවර්ධන ව්‍යාපෘතිය	මාසද	- මාර්ග සංවර්ධන අධිකාරිය
ජාජම	- ජාතික ජල සම්පාදන සහ ජලාපවහන මණ්ඩලය	රහොස	- රාජ්‍ය නොවන සංවිධාන
ජාජසනි	- ජාතික ජල සම්පත් නියෝජිතායතනය	ලඩ්වස	- ලංකා ධීවර වරාය නීතිගත සංස්ථාව
දිධිනි	- දිසා ධීවර ව්‍යාපෘති නිලධාරී	ලසම	- ලංකා සංචාරක මණ්ඩලය
ධීපඅමා	- ධීවර සහ ජල සම්පත් සංවර්ධන අමාත්‍යාංශය	ලෝපප	- ලෝක පරිසර පහසුකම
ධීසස	- ධීවර සමුපකාර සමිතිය	වපීදෙ	- වනජීවී සංරක්ෂණ දෙපාර්තමේන්තුව
නාසද	- නාගරික සංවර්ධන අධිකාරිය	විප්‍රක	- විශේෂ ප්‍රදේශ කළමනාකරණ
පරිඅමා	- පරිසර කටයුතු භාර අමාත්‍යාංශය	වෙසකව	- වෙරළ සම්පත් කළමනාකරණ ව්‍යාපෘතිය
පළාස	- පළාත් සභාව	සමුස	- හික්කඩුව සමුපකාර සමිතිය
පොලිස්	- පොලිස් දෙපාර්තමේන්තුව	සවනි	- සෞඛ්‍ය වෛද්‍ය නිලධාරී
ප්‍රාලේ	- ප්‍රාදේශීය ලේකම්	සංඅමා	- සංචාරක කටයුතු භාර අමාත්‍යාංශය
ප්‍රාස	- ප්‍රාදේශීය සභාව	හාම	- හාබර් මාස්ටර්
මගස	- මග පෙන්වන්නන්ගේ සංගමය	හිවියාස	- හික්කඩුව විදුරු පතුලැති යාත්‍රාකරුවන්ගේ සංගමය
මපද	- මධ්‍යම පරිසර අධිකාරිය	හිවිසස	- හික්කඩුව විශේෂ කළමනාකරණ ප්‍රදේශ / සමුද්‍ර අභයගුම් සම්බන්ධීකරණ කමිටුව

පරිභාෂිත ශබ්ද

අතුරු මාර්ගය	By-pass road	නිෂ්කාසන	Clearing
අවසාදන	Sediments	පර කිඳ බැසීම	Reef settlement
කසල ජලය	Waste water	පර තැන්පත් කිරීම	Reef placement
ගල්පර දූපත්	Rocky Islets	පැටවුම් ස්ථාන	Loading areas
ගවර වළ	Cess pool	පැති පියමං	Sidewalks
ගුරුපදේශ මාලා	Guidelines	ප්‍රතික වැංකි	Septic tank
ඝන කසල	Solid waste	පොදු පහසුකම්	Infrastructure
ඝන පුති ශේෂ	Septage	යාවත්කාලීන	Update
චූෂණ පොම්පය	Suction pump	වර්ධන කළමනාකරණ සැලසුම	Growth management plan
ජාලය	Network	වෙරළත	Shore
තටාකාංගන පහසුකම්	Dock facilities	වෙරළාරක්ෂිතය	Setback
නිරසාර මට්ටම්	Sustainable limits	සර්ෆ පුවරු	Surf boards
නිර්මාණ පරාමිති	Design parameters	සංචාරක කේන්ද්‍රය	Tourist centre
		සංචාරක රාත්‍රී	Guest nights
		සාධ්‍යතා අධ්‍යයනය	Feasibility Study
		සීමාවාසික	Interns
		සුපරීක්ෂණය	Monitoring
		ස්වභාව රක්ෂිතය	Nature reserve

6.1 වගුව- හික්කඩුව විශේෂ ප්‍රදේශ කළමනාකරණ සැලසුම ක්‍රියාත්මක කිරීම පිළිබඳ අරමුණු, ක්‍රමෝපාය සහ ක්‍රියාකාරකම් සාරාංශය

2 පරිච්ඡේදය - අඟයගුම් කළමනාකරණය							
අරමුණු. 1 අඟයගුම්ය තුළ පිහිටි හිරගල් පර පරිසර පද්ධතියේ සහ පෞච්ච විවිධත්වයේ භූගෝලීය වාඩිදියුණු කිරීම සහ ආරක්ෂා කිරීම							
2 මනා ලෙස ප්‍රතිලාභ වූ ක්‍රියාශීලී අඟයගුම් කාර්ය මණ්ඩලයක් බිහිකිරීම සහ නීතිය ක්‍රියාත්මක කිරීම සඳහා අවශ්‍ය ආම්පන්න ඔවුන්ට සැපයීම							
3 ප්‍රජාවගේ සහ මහජනතාවගේ දැනුම නැංවීම							
4 අඟයගුම්යේ භූගෝලීය ඉහළ නැංවීම සහ එහි කළමනාකරණය සඳහා ආදායම් මාර්ග ස්ථාපිත කිරීම							
5 බිවර කටයුතු වලින් සහ විදුරු පතුලැති යාත්‍රාවලින් අඟයගුම්යට එන හානිය අඩු කිරීම							
ක්‍රමෝපාය	ක්‍රියාකාරකම්	95	96	97	98	99	වගකීම
1 අඟයගුම් පරිහරණය කරන්නන්ට දැනුම ලබා දීම සඳහා සහ අඟයගුම් රෙගුලාසි ක්‍රියාත්මක කිරීම සඳහා විවිද කාර්ය මණ්ඩලය අඟයගුම්යේ පෙනී සිටීම මුර සංචාර යෙදීම සහ නිරන්තර කටයුතු වැඩි කිරීම	1 අඟයගුම් කාර්යාලයක් සහ අධ්‍යාපන පහසුකම් සැපයීම 2 අඟයගුම් මායිම් අලුතින් සකස්කර එය ස්වාභාවික රක්ෂණය කරන්නේවාට උසස් කිරීම 3 ජනාධිදේශ මුර සංචාරය සඳහා වටිනා නියාමකවරුන් සහ පොලිස් නිලධාරීන් ප්‍රමුඛ කිරීම 4 මුර කිරීමේ කාලසැලසුමක් පිළියෙළ කිරීම; අඟයගුම්ය නීතිපතාම දිවා රාත්‍රී මුර කිරීම 5 මුර සංචාර සඳහා අඟයගුම්යේ යාත්‍රාව සහ සර්ග පුවරු උපයෝගී කර ගැනීම 6 විවිද කාර්ය මණ්ඩලයට පැහැදිලිව හඳුනාගත හැකි නිල ඇඳුම් සැපයීම 7 අඟයගුම් මාර්ග සහ ටි කම්පය සඳහා යෝග්‍ය මෝස්තරයක් හෝ රා ගැනීමට පාසල් අතර හරහා සැලසීම 8 හිරගල් පර මත පා තැබීම වැළැක්වීමේ සංඥා පුවරු සවි කිරීම 9 හිරගල් පරිහරණය කරන සියල්ලන් සඳහා දැනුමැති කිරීමේ වැඩසටහන් සැලැස්වීම 10 පිහිනන්නන් සඳහා ඉවිලුම් රැඳවීම සහ නඩත්තු කිරීම 11 නව මායිම් සහ රෙගුලාසි ගැසට් කිරීම 12 අඟයගුම් මායිම් පැහැදිලි වීම පිණිස වෙරළක සලකුණු පර්යේෂණ කලාප බෝයා සහ දියඹ මායිම් බෝයා තැන්පත් කිරීම සහ ජවා නඩත්තු කිරීම 13 නීති උල්ලංඝනය කරන්නන් වෙතින් විවිද වරදක් දඩ මුදල් අය කරගනු ලැබීමේ වැඩපිළිවෙළක් ක්‍රියාත්මක කිරීම 14 විවිද නිලධාරීන් සඳහා වෙරළට ඉහළින් ඉදි කෙරුණු මුර පොළ දෙකක් තැනීම		○	○	○	○	විවිද වටිනා පවිලු පොලිස් වටිනා පොලිස් වටිනා වෙසකළ වටිනා විවිද ප්‍රාලේ විවිද විවිද විවිද විවිද විවිද විවිද
2 හික්කඩුව සමුපකාර සමිතිය වටිනා ජාපසනි සහ වෙසඳේ ජනාධිදේශ දැනුමැති කිරීමේ වැඩසටහනක් අඟයගුම් නරඹන්නන්ගේ කේන්ද්‍ර ස්ථානයක් සහ අධ්‍යාපන පහසුකම් සම්පාදනය කිරීම	1 කේන්ද්‍රයේ පරිහරණ වඩා සහ ඊට අවශ්‍ය බිම් ප්‍රමාණය නිර්ණය කිරීම 2 කේන්ද්‍රයේ ආදායම් සහ වියදම් ඇස්තමේන්තු ලෙගුම් කෙරෙන වාණිජ සැලසුමක් සම්පාදනය කිරීම 3 සමුපකාර සමිතියේ ඉඩම් ප්‍රයෝජනයට ගැනීමේ ගිවිසුමක් පිළිබඳව සාකච්ඡා කිරීම 4 සැලසුම් කිරීම සහ ඉදි කිරීමේ කටයුතු සඳහා මුදල් ප්‍රතිපාදන ලබා ගැනීම 5 කොන්ග්‍රාන් ගිවිසුම සකස් කිරීම සහ ඉදිකිරීමේ අධීක්ෂණය 6 කේන්ද්‍රය මුල් කරගෙන දැනුමැති කිරීමේ වැඩසටහනක් සම්පාදනය 7 රාජ්‍ය නොවන සංවිධානයක් පිහිටුවීමෙන් සහ නැරඹුම් ගැස්තු අය කිරීමෙන් අඟයගුම් හාර පරමුදලක් ස්ථාපිත කොට කේන්ද්‍රය කළමනාකරණය සඳහා දායක වීම 8 හික්කඩුව සමුපකාර අඟයගුම්යට දැන් ඔබ පිවිසෙයි මේ පාතික වස්තුව සුරැකීමට සහාය වන්න යනුවෙන් සඳහන් මාර්ග සංඥා පුවරුවක් ඉදිකිරීම	●	○	○	○	○	හිවසස හිවසස හිවසස වටිනා විවිද ලෝපප විවිද වෙසඳේ විවිද ජාපසනි වෙසඳේ හිවසස හිවසස

● දැන් කෙරෙන හෝ සම්පූර්ණ කෙරුණු හෝ ක්‍රියාකාරකම්
 ○ යෝජිත ක්‍රියාකාරකම්

අගයනුම් කළමනාකරණය (කලින් පිටුවෙන්)								
ක්‍රමෝපාය	ක්‍රියාකාරකම්	95	96	97	98	99	වගකීම	
3. බිවර වරාය පුනර්නිරාපනය කිරීම සහ අගයනුම්යෙන් බිවර යාත්‍රා ඉවත් කිරීම	1. විප්‍රක සැලසුමේ ක්‍රමෝපාය පිළිබඳව බීජෆමා වෙත තොරතුරු ලබා දීම සහ වරාය පුනර්නිරාපනය කිරීමේ ගද්ධි අවශ්‍යතාව ගැන දැනුවත් බව වර්ධනය කිරීම	●	○					ශීචියාසූ වෙසකල් වෙසඳේ දැඩි බීජෆමා
	2. දැනට ඇති පසුබිම් තොරතුරු බීජෆමා වෙත ලබා දීම	●	○					ශීචියාසූ බීජෆමා, ප්‍රාංශ්, වට්ටේ දිබ්බි, වෙසකල් බීජෆමා
	3. වරාය පුනර්නිරාපනය සඳහා අවශ්‍ය ප්‍රතිපාදන ලබාගත හැකි මාර්ග ගැන සොයා බැලීම	●	○					ප්‍රාංශ් බීජෆමා, ශීචියාසූ, බීජෆමා, දිබ්බි දිබ්බි, වෙසකල් බීජෆමා
	4. බිවර සම්පතකර සමීච්ච්ච් කිරීම	●	○	○	○	○		
	5. වරාය පහසුකම් කළමනාකරණය පිළිබඳව සහ යාත්‍රා නැවතුම් ස්ථාන ක්‍රියාත්මක කිරීම පිළිබඳව සාකච්චා පැවැත්වීමට සැලැස්වීම	●	○	○	○	○		ප්‍රාංශ් බීජෆමා, ශීචියාසූ, බීජෆමා, දිබ්බි දිබ්බි
	6. වරාය සහ වෙරළන පහසුකම් පිළිබඳව විස්තර සකස් කිරීම	●	○	○	○	○		වට්ටේ, බීජෆමා, බීජෆමා, දිබ්බි
	7. වරායෙන් හොඳින් වැලි පරිහරණය කිරීම ගැන සොයා බැලීම (රාජ්‍යේ ගිරිගල් වලට පිටවීම, පාරවල් පලු කිරීම සහ ක්‍රියාත්මක මට්ටම් කිරීම සඳහා යොදා ගැනීම); සහ වරායෙන් වැලි ඉවත් කිරීමට බලපත්‍ර දීම			○				වෙසඳේ, මධ්‍ය ප්‍රාංශ්
	8. බිවර යාත්‍රා වරායට මාරු කිරීම		○					වට්ටේ, බීජෆමා, බීජෆමා
	9. වරායට ප්‍රවේශය වීමේ ඇසුරු මත පටු බැවින් සුරක්ෂිත තාවය තබා එය සලකුණු කිරීම		○		○			ලුබ්බියා, බීජෆමා
	10. යාත්‍රාවලින් ඉවතලන එන්ජින් තෙල් එකතු කිරීමට සහ බැහැර කිරීමට පහසුකම් සැලැස්වීම		○	○	○	○		ලුබ්බියා, බීජෆමා
4. ශීචියාසූ වට්ටේ සහ ප්‍රාස සහයෝගිතාව මගින් අගයනුම්ය තුළ විදුරු පහලැති යාත්‍රා මෙහෙයවීම පාලනය කිරීම	1. ශීචියාසූ බිච් කිරීමට සහායවීම	●	○					වෙසකල්, ප්‍රාංශ්
	2. යාත්‍රා මෙහෙයවීම පිළිබඳ රෙගුලාසි ස්ථාපිත කිරීම		○					වට්ටේ, ප්‍රාස, පොලිස්
	3. අගයනුම්ය තුළ මෙහෙයවීමට අවසර දෙන යාත්‍රා ගණන වසරකට 40 කට සීමා කිරීම		○	○	○	○	○	
	4. යාත්‍රා හිමියන් සඳහා නිති රෙගුලාසි, ගිරිගල් පර පරිසර පද්ධතිය සහ යාත්‍රා එන්ජින් නඩත්තුව පිළිබඳව වැඩි මුළු පැවැත්වීම	●	○					වෙසකල්, වට්ටේ
	5. පුහුණුව සහ සමුහ රක්ෂණ ලබා ගැනීම සඳහා ශීචියාසූ ට සහාය වීම		○	○	○			වෙසකල්, ගාම
	6. නැංගුරම් පොලවල් සහ තවාකාගත පහසුකම් සහිත පැටවුම් ස්ථාන වෙත කිරීම		○	○	○	○	○	වට්ටේ, පාසයති
	7. යාත්‍රා සහ මගීන් සඳහා නම් වාරය එනතුරු පෝලිමේ සිට අවසරපත්‍ර ලබාගැනීමේ ක්‍රමයක් ඇති කිරීම			○	○	○	○	ශීචියාසූ, වෙසඳේ, ප්‍රාස
	8. අගයනුම් කළමනාකරණය සඳහා සෑම මහියෙකුගෙන්ම සුළු භාස්තුවක් හෝ පරිත්තාගයක් හෝ බැඳි රැස් කිරීමේ ක්‍රමයක් ඇති කිරීම			○	○	○	○	ශීචියාසූ
	9. යාත්‍රාවලින් ඉවතලන එන්ජින් තෙල් එකතු කිරීමට සහ බැහැර කිරීමට පහසුකම් සැලැස්වීම		○	○	○	○	○	ප්‍රාස, ශීචියාසූ, වට්ටේ, ශීචියාසූ, ලුබ්බියා
	10. ගල්පර දුරක් අසල විදුරු පහලැති යාත්‍රා සඳහා නැංගුරම් දෙකක් සහ ඉච්චුම් සවිකිරීම		○					වට්ටේ, ශීචියාසූ, පාසයති
5. වට්ටේ, පාසයති සහ වියවිද්‍යාල සමඟ සහයෝගයෙන් අගයනුම්ය සඳහා පර්යේෂණ / සුපරීක්ෂණ සැලසුමක් සම්පාදනය සහ ක්‍රියාත්මක කිරීම	1. සුපරීක්ෂණය සහ විප්‍රක සැලසුම්කරණය අතර සම්බන්ධතා ඇති කිරීම	●	○	○	○	○		ශීචියාසූ, වෙසඳේ
	2. ප්‍රයෝග ගුණාත්මක තාවය ගැන සුපරීක්ෂණය සඳහා ප්‍රතිපාදන ලබා ගැනීම		○	○	○	○	○	වට්ටේ, පාසයති
	3. පර්යේෂණ සහ සුපරීක්ෂණ වගකීම් භාරදීම	●	○	○	○			ශීචියාසූ, පාසයති
	4. සුපරීක්ෂණය සඳහා දර්ශන නිර්ණය කිරීම සහ කාලසටහනක් සකස්වීම		○	○	○			
	5. සුපරීක්ෂණය කරගෙන යාම් සඳහා වට්ටේ ධාරිය මණ්ඩලය සහ ප්‍රදේශයේ සංවිච්චා සේවකයන් පුහුණු කිරීම			○	○	○	○	වට්ටේ, පාසයති, කොළී
	6. එකම වු දර්ශන සඳහා සුපරීක්ෂණ කාලසටහන අධීක්ෂණය කිරීම සහ ක්‍රියාත්මක කිරීම		○	○	○	○	○	පාසයති
	7. ගිරිගල් පර කිදා බැසීම සහ කැණීම පර නැන්පන් කිරීම සම්බන්ධයෙන් පරීක්ෂණ පැවැත්වීම	●	○	○	○	○	○	පාසයති, කොළී

3 පරිච්ඡේදය - ජලයේ ගුණය කළමනාකරණය සහ කසළ බැහැර කිරීම

- අරමුණු.** 1. විප්ලව ප්‍රදේශය තුළ ජලයේ සහ සමස්ත පරිසරයේ ගුණය වැඩි දියුණු කිරීම
 2. අභයගුණීය පිළියම් නොකළ හෝ යන්තමින් පිළියම් කළ හෝ කසළ ජලය එක්කිරීම මුලිනුපුටා දැමීම
 3. පොදු ස්ථානවල තැන්පත් කරන සහ අභයගුණීයට එක් කරන ඉවතලන උව්‍ය සහ ඝන කසළ මුලිනුපුටා දැමීම
 4. කසළ බැහැර කිරීමේ කටයුතු මෙහෙයවීම සහ නඩත්තුව සඳහා භාස්තූ ගෙවීමේ ක්‍රමයක් හඳුන්වා දීම

ක්‍රමෝපාය	ක්‍රියාකාරකම්	95	96	97	98	99	වගකීම
1. ගාල්ල මහ නගර සභාව හා සහයෝගයෙන් ඝන කසළ බැහැර කිරීමේ යෝග්‍ය ක්‍රමයක් ප්‍රාදේශීය සභාව මගින් සකස් කිරීම සහ ක්‍රියාත්මක කිරීම	1. ප්‍රාදේශීය සභාව හා හෝවලකරුවන් අතර සංවාදයකට ඉඩ සැලැස්වීම 2. ඝන කසළ ප්‍රශ්නය නිරාකරණය සඳහා අධ්‍යයනයක් පැවැත්වීම 3. කසළ බැහැර කිරීම සමඟ කොම්පෝස්ට් පොහොර තැනීමේ සහ ප්‍රතිචක්‍ර කිරීමේ වැඩ පිළිවෙළ ඒකාබද්ධ කිරීම 4. කසළ පිරවුම් ස්ථානයක් පිහිටුවීම සඳහා ගාල්ල මහ නගර සභාව සමඟ සහයෝගයෙන් ක්‍රියා කිරීම 5. කසළ රැස් කිරීම සඳහා විශදම් දැරීමට බදු එකතු කිරීමේ වැඩ පිළිවෙළ වැඩි දියුණු කිරීම 6. කසළ ප්‍රවාහණය සඳහා රථවාහන මිලදට ගැනීම සහ ක්‍රියාත්මක කිරීම 7. කසළ නිසි ලෙස බැහැර නොකරන්නන්ට දඩ ගැසීමේ ක්‍රමයක් ක්‍රියාත්මක කිරීම 8. දැනුමැති කිරීමේ ව්‍යාපාර පැවැත්වීම සහ දෙවසරකට වරක් සම්පූර්ණයෙන්ම පිරිසිදු කිරීමේ වැඩපිළිවෙළක් ක්‍රියාත්මක කිරීමට පුජා කණ්ඩායම් දිරිමත් කිරීම 9. ගාලු පාර ඔස්සේ සහ වෙරළ ඔස්සේ කසළ බදුන් තැබීම; පලදායී ලෙස කසළ රැස් කිරීමේ ක්‍රමයක් සැකසීම	● ●	○	○	○	○	ගිවිසය වෙසකව හෝටල සමුස ප්‍රාය ප්‍රාලේ එපා; කොළඹ ප්‍රාය ප්‍රාලේ ප්‍රාය නිව්යස ප්‍රාය ප්‍රාය ආපා පොලිස් ප්‍රාය රනාස ප්‍රාලේ හෝටල ප්‍රාය හෝටල
2. සංචාරක ව්‍යාපාර ස්ථානවලට සහ නගර මධ්‍යයට සේවය සැලසීම පිණිස කසළ ජලය පිළියම් කිරීමේ ක්‍රමයක් සැකසීම	1. පරිසර දූෂණයට ඉඩදෙන සියලු මුද්‍රාලු හඳුනා ගැනීම 2. කසළ ජලය පිළියම් කිරීමේ ක්‍රමයක් ගැනීම පිණිස අවශ්‍ය ප්‍රතිපාදන සපයා ගැනීම සඳහා පෞද්ගලික ආයෝජනයක් සහ පුදන නියෝජිතයන් සමඟ සම්බන්ධතා ඇති කර ගැනීම 3. නිර්මාණ පරාමිති සමඟ සැකදෙන පරිදි වත්මන් සැලසුම් යාවත්කාලීන කිරීම 4. කසළ ජලය ගලා බැසීමේ පිළියම් කිරීමේ සහ ඒ කටයුතු පුපරික්ෂණය කිරීමේ ක්‍රමයක් ක්‍රියාත්මක කිරීම 5. මෙහෙයුම් විශදම් පිටවා ගැනීම පිණිස භාස්තූ අග කිරීමේ ක්‍රමයක් ක්‍රියාත්මක කිරීම 6. ප්‍රතික්ෂේප වැඩි දියුණු කිරීමට භාස්තූ සහාය සැලසීම 7. ගවර වළවලින් සහ ප්‍රතික්ෂේප වැඩිවලින් ඝන ප්‍රති ශේෂ ඉවත් කිරීම පිණිස මුණා පොම්ප වැනි රථයක් මිලදට ගැනීම සහ නඩත්තුව කිරීම 8. අභයගුණීය සඳහා පොදු වැසිකිලි ඉදිකිරීම සහ නඩත්තුව කිරීම	●	○	○	○	○	සවිනි මපා; මසප. ප්‍රාලේ ඉනි ගිවිසය මපා; වෙසද පාපළම මපා; පාපළම මපා; පාපළම ප්‍රාය ප්‍රාය පාපළම ගිවිසය මපා; සවිනි ප්‍රාය ගිවිසය; ප්‍රාය
3. පරිසර දූෂකවල සහ අවසාදනවල සියලු මුද්‍රාලු හඳුනාගැනීමෙන් ද ඒ සඳහා පාලනයක් ස්ථාපනය කිරීමෙන් ද අභයගුණීය තුළට අවට මුහුද තුළටත් පරිසර දූෂක සහ අවසාදන ඇතුළුවීම අඩු කිරීම	1. අපද්‍රව්‍ය බැහැර කිරීම සම්බන්ධයෙන් මහජනතාව, හෝටල සහ අවන්තල කාර්ය මණ්ඩල විදුරු පතුලැහි යානා සහ ධීවර යානා මෙහෙයවන්නන් දැනුමැති කිරීම 2. අභයගුණීයේ ධීවර යානා ඉවත් කිරීම 3. ධීවර තුළ දී අපද්‍රව්‍ය හෙල් බැහැර කිරීමේ ක්‍රමයක් සැකසීම සහ ක්‍රියාත්මක කිරීම 4. මහාමාර්ග පිටාර පල මං අභයගුණීයෙන් බැහැරට යන පරිදි දීර්ඝ කිරීම සහ ඒවා වෙත අහකට යොමු කිරීම 5. ඇළ මාර්ගවලට දූෂක එක් කරන මුද්‍රාලු හඳුනාගැනීම; දැනුමැති කිරීමෙන් සහ නීතිය ක්‍රියාත්මක කිරීමෙන් ඒවා එක් කිරීම අඩු කිරීම 6. පරිසර දූෂණය සහ අවසාදන හානිය අඩු කිරීම සඳහා ඇළ දෙපස ඉඩම් පරිහරණය සහ ඉදිකිරීම් පාලනය කිරීම 7. අභයගුණීය තුළට ගලා යන අවසාදන ප්‍රවාහය අවම කිරීම පිණිස නියම සමයේ දී ඇළ ගැලීම සහ පිරිසිදු කිරීම සම්බන්ධීකරණය 8. ඇළ මාර්ගවලින් සහ දුහුදෙන් පල නියැදි රැස් කිරීම සම්බන්ධීකරණය	●	○	○	○	○	වළංදේ දිවිනි ගිවිසය ධීවර මා; ධීවර ලඹේපා ධීවර ප්‍රාය දිවර ගිවිසය එපා; ගිවිසය වෙසද සවිනි මසප ප්‍රාලේ ඉනි පපසති නාසප ප්‍රාලේ ප්‍රාය මසප ප්‍රාලේ ප්‍රාය මසප නාසප පාපසති මපා

4 පරිච්ඡේදය - වෙරළබඩ සංවර්ධනය, පොදු පහසුකම් සහ පාරිසරික වැඩිදියුණුව

- අරමුණු,** 1. වැල්ල ප්‍රදේශයේ වෙරළට මහජන පිවිසුම් මාර්ගය නිසි ලෙස සකසා ගැනීම
 2. විපුක ප්‍රදේශය තුළ සීමාවක් රහිත වූ හෝ නීති විරෝධී ලෙස සැලසුම් කළ හෝ ඉදිකිරීම් සහ සංවර්ධන කටයුතු පාලනය කිරීම
 3. විඩාත් ප්‍රියජනක සහ සුරක්ෂිත ස්ථානයක් බවට හික්කඩුව පත් කිරීම සඳහා රට්ටාතන වේගය සහ ශබ්ද දූෂණය අඩු කිරීම

ක්‍රමෝපාය	ක්‍රියාකාරකම්	95	96	97	98	99	ටීකිට්	
1 විපුක ප්‍රදේශය පුරා වෙරළ තීරව තුළ ගොඩනැගිලි රෙගුලාසි සහ වේසදේ වෙරළාරක්ෂිත අවයව ක්‍රියාත්මක කිරීම	1 සැලසුම් කිරීමට සහාය වීම, රෙගුලාසි ක්‍රියාත්මක කිරීම සහ ප්‍රාදේශීය පාරිසරික කාර්ය මණ්ඩලිකයෙකු ලෙස ක්‍රියා කිරීම සඳහා හික්කඩුව ප්‍රාදේශ කාර්යාලයට එක් කිරීම 2 වෙරළාරක්ෂිත සහ ගොඩනැගිලි සඳහා සපුරාලිය යුතු අවයව නිර්ණය කිරීම 3 සියලු ගොඩනැගිලි කටයුතු සුපරීක්ෂණය සහ බලපත්‍ර ලබාගැනීම අවයවයක් බවට පත් කිරීම 4 වෙරළේ සියලු මහජන පිවිසුම් ස්ථාන ගඳුනාගැනීම සහ අවයව ඉඩම් පවරා ගැනීම 5 පවත්නා වෙරළාරක්ෂිතවලට සබ්වෙන් මහජන පිවිසුම් මාර්ග පාලනය කරමින් පැරණි ගොඩනැගිලි නැවත ඉදිකිරීම සඳහා බලපත්‍ර දීම ප්‍රතික්ෂේප කිරීම 6 අලුතෙන් නීති විරෝධී ලෙස වෙරළාරක්ෂිත උල්ලංඝනය කිරීම් සඳහා දඩ නියම කිරීම සහ දඩ මුදල් බාර ගැනීම 7 වෙරළ බාධකය වැළැක්වීම සඳහා වෙරළ මද වශයෙන් හෝ ස්ථාපනය කිරීමේ භාෂණය දිරිමත් කිරීම 8 නිසි අධ්‍යයනයකින් පසුව වෙරළ පෝෂණය සඳහා වරාය තුළ පිහිටි වැලි සංචිත භාවිතා කිරීම 9 විපුක ප්‍රදේශයේ වෙරළේ සියලු වැලි ගොඩ දැමීම අත්හිටුවීම සහ ඒ බව සුපරීක්ෂණය	●	○	○	○	○	○	ප්‍රාදේශ වේසදේ, වේසදේ පරිපාලන වේසදේ ප්‍රාදේශ වේසදේ ප්‍රාදේශ ප්‍රාදේශ ප්‍රාදේශ
2 පාලනයක් රහිත ඉදිකිරීම් සහ සංවර්ධන කටයුතු වැළැක්වීමට හික්කඩුව සඳහා විර්ධන කළමනාකරණ සැලසුමක් සකස් කිරීම	1 හික්කඩුවේ සංචාරක පරිසරය සංවර්ධනය කිරීම සඳහා 1987 දී ඉදිරිපත් කෙරුණු නාසඳ සැලසුම යාවත්කාලීන කිරීම සහ ඊට අමතර මණ්ඩල අනුමැතිය ලබා ගැනීම 2 සංවර්ධන කටයුතු සම්බන්ධයෙන් වෙරළ කළාප කළමනාකරණ සැලසුමේ ලැයිස්තුවලට ක්‍රියාත්මක කිරීම 3 සාගර විද්‍යාත්මක රටා සහ අවසාදන වලනය පිළිබඳ අධ්‍යයනය 4 යෝජිත දකුණු ප්‍රදේශ සංවර්ධන සැලසුම තුළට හික්කඩුව විපුක සැලසුම අන්තර්ගත කිරීම	●	○	○	○	○	හික්කඩුව නාසඳ වේසදේ ප්‍රාදේශ ජාත්‍යන්තර හික්කඩුව	
3 අනුමැතිය, දඩ ගැසීම් සහ රට්ටා ගමනාගමන නවතා තැබීම පාලන කටයුතු ක්‍රියාත්මක කිරීමෙන් රට්ටාතන වේගය, ශබ්දය, සහ තදබදය අඩු කිරීම	1 නීතිය ක්‍රියාත්මක කිරීමට සහ දඩ ගැසීමට පොලීසිය දිරිගැන්වීම සඳහා ඔවුන් සමග සාකච්ඡා කිරීම 2 නොසැලකිලිමත් සහ අධිවේගී රියදුරන්ට ඉහළම දඩ නියම කිරීමට බලය දීම 3 ගාලු පාර ඔස්සේ අවිවාදාත්මක විදුලි සංඥා සහිත කිරීම 4 පැයකී 40 තෙක් වේග සීමාව අඩු කිරීම සහ වේග සීමා සංඥා පුවරු ද ගැටි සහිත ඉස්සර නොකිරීමේ රේඛා හෝ මාර්ග බෙදීම රේඛා ද වැඩිපුර පිහිටුවීම 5 අතුරු මාර්ගයක් තැනවීම සඳහා වූ නාසඳ යෝජනාව පිළිබඳව කටයුතු කිරීම 6 නගර මධ්‍යය සඳහා වාහන නැවතුම් පොළක් මග විදියෙන් බැහැරව පිහිටුවීම 7 නගර මධ්‍යයේ ගාලු පාර දෙපසින් පැති පියමං ඉදිකිරීම	●	○	○	○	○	හික්කඩුව පොලීසි ප්‍රාදේශ පොලීසි හෝටල මාසඳ නාසඳ මාසඳ ප්‍රාදේශ මාසඳ ප්‍රාදේශ	

5 පරිච්ඡේදය - සංචාරක සංවර්ධනය සහ ජීවනෝපා ඉඩප්‍රස්ථා

- අරමුණු:**
- 1 ප්‍රදේශයේ තරුණයන්ගේ රැකිරීම සඳහා සංචාරක කර්මාන්තය ආශ්‍රිත නව මාදිලියක උපදෙස් සකස් කිරීම
 - 2 ප්‍රදේශයේ සංචාරක මග පෙන්වන්නන්ගේ සේවයේ තත්ත්වය වැඩි දියුණු කිරීම
 - 3 විධිමත් සහ අවිධිමත් සංචාරක ව්‍යාපාර අතර සම්බන්ධතා සහ සහයෝගීතාව වැඩිදියුණු කිරීම

ක්‍රමෝපාය	ක්‍රියාකාරකම්	95	96	97	98	99	වගකීම
1 නියාමක ව්‍යාපෘති කිහිපයක් මගින් ප්‍රදේශයේ තරුණයන් සංචාරක මග පෙන්වන්නන් සහ තැරැවිකරුවන් සඳහා රැකිරීමේ ඉඩ ප්‍රස්ථා බිහි කිරීම	<ol style="list-style-type: none"> 1 කුරුමුල්ල නිර්වෘත්තය, විනෝදාත්මක මසුන් ඇල්ලීම, මිරු පැදීම, රුවල් යාත්‍රා කිරීම සහ කුඩා ව්‍යාපාරවල නියැලීම වැනි සංචාරකයන්ගේ ක්‍රියාකාරකම්වල රැකිරීමට සාධක සැපයීම 2 සංචාරක මග පෙන්වන්නන්ට : තැරැවිකරුවන්ට මගපෙන්වීම සඳහා සහ සංචාරක මග පෙන්වීම පිළිබඳ පුහුණුවක් ලබාදීම 3 සාම්ප්‍රදායික අත්කම් භාණ්ඩ නිපදවීම පිළිබඳ පුහුණුව සඳහා බෙන්තොට පනකලා කේන්ද්‍රය හා සම්බන්ධ වීම 4 මුලික මට්ටමේ හෝටලකරුවන් පුහුණු කිරීමේ පාඨමාලාවක් නික්කඩුවේ ස්ථාපිත කිරීම 5 හෝටල ශිෂ්‍යයන් සඳහා ප්‍රවේශ මට්ටමේ සීමාවාදිත තනතුරු සැපයීම 		○	○			ලැසම්, මගම, හෝටල ලැසම්, මගස
2 විධිමත් සහ අවිධිමත් සංචාරක ව්‍යාපාර අතර සහයෝගීතාව ප්‍රවර්ධනය කිරීම	<ol style="list-style-type: none"> 1 සියලු සංචාරක සංවිධානවලට, හිටපු සහ නව පුරුණ නියෝජනය ලබාදීම 2 විධිමත් සහ අවිධිමත් සංචාරක මෙහෙයුම්කරුවන්ගේ අනන්‍යතා ලැබීම සහ සාකච්ඡා කිරීමට දෙපාර්තමේන්තුවලින් නව සංවිධානයක් බිහි කිරීම 3 අවිධිමත් අංශයේ සංචාරක මෙහෙයුම්කරුවන්ට පුහුණුව ලබාදීම 4 සංචාරක මග පෙන්වන්නන්ගේ බලපත්‍ර නිත්‍යනුකූල කිරීම සහ නීතිය ක්‍රියාත්මක කිරීම ඉහළ දැමීම 5 බලපත්‍ර නිකුත් කිරීමෙන් වැළැඳීම වෙළෙඳුන්ගේ කටයුතු පාලනය කිරීම 	●	○	○	○	○	හිටපු සහ හිටපු සහ, හෝටල ලැසම්, ප්‍රාස, ලැසම්, ප්‍රාස, ලැසම්, ප්‍රාස
3 ප්‍රජාව සහ සංචාරක කර්මාන්තය අතර සහයෝගීතාව ප්‍රවර්ධනය කිරීම	<ol style="list-style-type: none"> 1 ප්‍රදේශයේ ආර්ථිකය සහ පරිසරය කෙරෙහි සංචාරක කර්මාන්තයේ වැදගත්කම ගැන පාසල ශිෂ්‍ය ශිෂ්‍යාවන් දැනුම්බර කිරීම 2 ඒකීය රෝගය, මත්ද්‍රව්‍ය භාවිතාව සහ ගණිතා වෘත්තීය පිළිබඳව සංචාරක කර්මාන්තය, පාසල සහ සමාජ සේවාවන් අතර අධ්‍යාපන පාලනය ස්ථාපිත කිරීම 3 කුඩා පරිමාණයේ ප්‍රජා වැඩිදියුණු කිරීමට ආධාර කිරීම 		○	○	○	○	පාසල, ප්‍රාස, හෝටල ප්‍රාස, පාසල, හෝටල, රානොස හෝටල, ලැසම්
4 ලංකා සංචාරක මණ්ඩලයේ කාර්යාලයක් නික්කඩුවේ ස්ථාපනය කිරීම	<ol style="list-style-type: none"> 1 සංචාරක තොරතුරු සේවා, එයාර් ලංකා ගුවන් බලපත්‍ර වෙන් කරවා ගැනීම සහ ප්‍රදේශයේ නවාතැන් ඉඩකඩ පිළිබඳ නිෂ්කාසන සේවා සපයන සංචාරක කේන්ද්‍ර ස්ථානයක් සඳහා සැලසුම් පිළියෙළ කිරීම 2 සංචාරක කාර්යාලයක් පිහිටුවන මෙන් ලැසම් වෙත ලිඛිතව දන්වා ගැනීම 3 සංචාරක කාර්යාලය සඳහා ස්ථානයක් හෝරා ගැනීම 4 සෞඛ්‍ය, නවාතැන් ඉඩකඩ සහ පරිසරය සම්බන්ධයෙන් ද්‍රෝණිත කිරීමක් සහිතව නික්කඩුවේ සියලුම සංචාරක ව්‍යාපාර ස්ථාන පිළිබඳ තොරතුරු සැකසීම 5 සංචාරක කාර්යාල මගින් තොරතුරු සහ සංචාරක කර්මාන්තයේ පුහුණුව සැපයීම 		○	○			හිටපු සහ, ලැසම්, ප්‍රාස හෝටල, හිටපු සහ ලැසම්, ප්‍රාස, හෝටල හෝටල, ලැසම්
5 සංචාරක පොලීසි ඒකකයක් ස්ථාපනය කිරීම	<ol style="list-style-type: none"> 1 විශේෂ පොලීසි ඒකකයක් පිහිටුවන මෙන් ගාල්ල පොලීසි අධිකාරිවරයා වෙත ලිඛිතව දන්වා ගැනීම 2 හෝරාගත පොලීසි නිලධාරීන්ට, හෝටලකරුවන් මගින් අවිධිමත් පුහුණුවක් සැපයීම 3 පරිවර්තනයක් ලෙස කටයුතු කිරීම සඳහා ප්‍රදේශයේ දැන පුද්ගලයන් කණ්ඩායමක් පිළියෙළ කිරීම 4 පොලීසි මුර සංචාර සඳහා එන්ජින් සහිත ධාතුවක් ලබා ගැනීම 		○	○	○	○	හිටපු සහ පොලීසි, හෝටල ප්‍රාස, පොලීසි, පාසල, පොලීසි

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