SURVIVAL STRATEGIES OF PEOPLE IN A SRI LANKAN WETLAND

Livelihood, Health and Nature Conservation in Muthurajawela

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anneke hoogvorst

Foreword

This thesis presents the findings of an anthropological study on survival strategies of people in a Sri Lankan wetland in relation to livelihood, health, and nature conservation. The motivation to study survival strategies in general and perceptions of health and well-being in particular, originates from my earlier work as a nurse and as an anthropologist in Africa and Asia. My idea to conduct research in the beautiful wetland called Muthurajawela was born when the project staff of the Integrated Resources Management Project (IRMP) expressed the need to learn more about the communities that live in the marshes. The place had already attracted many students from the Netherlands, who collected valuable information on mainly technical issues, such as water management, housing schemes, roads and electricity supply. However, even studies on community development did not reveal much about the strategies used by people living in this environment. Apart from the topic of livelihood, this thesis also deals with topics in the medical sphere, because living in a swamp is supposed to be unhealthy, especially for the poor people who have limited means to protect themselves from the unhealthy conditions. Hopefully, the results of this research will be useful for planners, decision-makers, Non-Governmental Organisations (NGOs), and students involved in reconciling conservation and development objectives.

I began the study in June 1998 with a reconnaissance visit to Muthurajawela and an explorative literature search in July and August in the Netherlands. Professor Peter Kloos attached to the Free University in Amsterdam was willing to be my academic supervisor. Back in Sri Lanka in September 1998, the study plan and objectives were elaborated in greater detail. Regrettably, Peter Kloos became very ill in Spring 1999 and I was advised to look for another supervisor. Professor Anke Niehof of Wageningen University was interested in the subject and willing to take over the supervision. It was very sad to learn of the death of Peter Kloos in August 2000. Unavoidably, the change of supervisors led to a slight shift of focus in the study.

The Ph.D. research and the writing of the thesis were a challenging activity, which I undertook with much pleasure. Needless to say, other people's time and energy were also involved. The research could only be brought to a good conclusion thanks to the inspiring supervision of professor Anke Niehof. She guided me along the theoretical tracks and supervised the preparation of the dissertation by giving advice and correcting and discussing the draft chapters. I would like to express my sincere thanks for this, and, above all, for the pleasant way in which she carried out the supervision.

I wish to thank Daphne Wittich-Rainey and Roy Jordaan for their efforts to improve the manuscript. They edited the English and gave useful editorial suggestions. Likewise, thanks are due to Hester Moerbeek for her encouraging comments on the first draft of the thesis.

I am grateful to Hans Rolloos for luring me into the boggy realm of Muthurajawela and for the support in the field. I also thank Jayampathi Samarakoon, Hans van Zon and Mathieu Brugman for their comments on the wetland related chapters. Hashini and Ranjani Fernando, thank you very much for your assistance and translations in the field. It was really a pleasure to work with you. Other persons I would like to thank for their assistance and friendship are Nalaka, Nadeera, Hemanthe, Nirosha, Akram, Nilanthi, Chulani and many others at 'The Marsh' field office and IRMP office.

I am indebted to MUPO/Janodya and CEA/IRMP organisations for their information and allowing me access to documents for a prolonged period of time. Many thanks to the GIS section of CEA, and to Chandri in particular, for the preparation of the maps for this thesis. Other institutes that provided me with valuable information in Sri Lanka are: International Water Management Institute (IWMI), Netherlands Embassy, Medical Research Institute (MRI), IUCN, UNICEF, UNFPA, Sumitrayo and Shell Gas.

Special thanks go to my ever-supportive husband, for critically reading the manuscript and for his well-considered opinions. Dorien, my lovely daughter, I thank you for your warning to beware of the crocodiles in the marsh.

Finally, I would like to dedicate this book to the people of Muthurajawela. They always received me with an incredible hospitality. Sometimes they pulled out a chair even before I had entered their house, and, once seated, climbed a coconut tree to fetch me the best king-coconut within their reach. They made my voyage through their realm a truly serendipitous one.

Anneke

Abstract

Hoogvorst, A.A. (2003), *Survival strategies of people in a Sri Lankan wetland: Livelihood, health and nature conservation in Muthurajawela*. Ph.D. thesis, Wageningen University.

The objective of this study was to contribute to a better understanding of how poor people living in a sensitive wetland ecosystem maintain their livelihood and experience their situation in relation to health and diseases. Over the past nine years a wetland management project contributed to public awareness on environmental protection and implementation of conservation plans. Matching conservation with sustainable use of the wetland resources and human development is the most difficult and least tested aspect of environmental management. Anthropology and aspects of health and environment meet in this dissertation, in which some attention is also given to gender issues.

Muthurajawela wetland
The ecosystem of the wetland is under severe stress because of population pressure, pollution and destructive fishing methods. Human encroachment in the marsh and the lagoon area takes place because of poverty. The number of families that live in different settlements in the marsh and on the channel islands of the lagoon has increased considerably over the years.

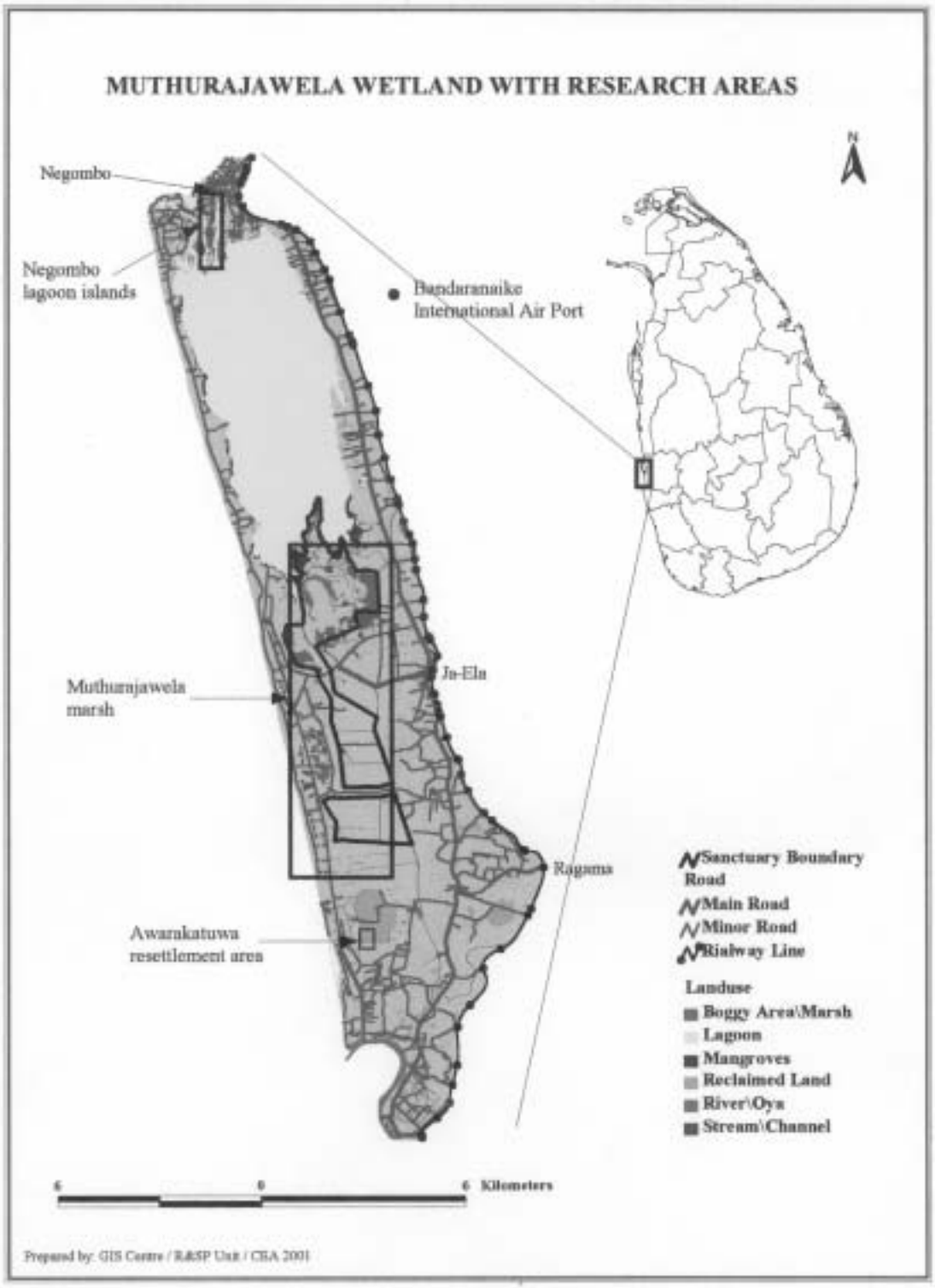
Methods
There are differences in the ways inhabitants perceive their life in a wetland (emic view), and the way scholars, scientists or outsiders look at people living in a hazardous marsh (etic factors). To obtain the information on the different perspectives, a literature study was carried out, and quantitative and qualitative information was collected through interviews with the marsh dwellers and key-informants. Additional information was gathered through life histories, case studies and (participant) observation. Open interviews were also held with different types of traditional healers.

Results
The main problems for the inhabitants are: low income, alcohol addiction, floods, marsh-related health hazards, land availability and illegal land occupation. Many people in the wetland bring their gold and jewelry to pawn shops to improve their dwelling or just to buy daily needs. Locally brewed *kasipu* brings the livelihood of many households in a critical situation and many addicted men suffer from alcohol related liver disease of which they often die. The wetland inhabitants who suffer from floods a few times per year, cope reasonably well during the period of inundation. The inhabitants of the marshy area in the wetland feel that they are less prone to infectious diseases than the people who live on the densely populated islands in the channel of the lagoon. People protect themselves against mosquito-bites by using coils and the better-off people also use bed-nets. Waste, scrap and other material is used by people to create land where their children can build a house. Being illegal residents make people feel unhappy and has an inhibiting effect on taking initiatives to improve their condition. There is no one set of strategies for matching nature conservation with human development that works everywhere. Strategies should be tailored to the setting in which they are employed.

Key words:

Anthropology, emic, environment, etic, gender, health, livelihoods, Muthurajawela, nature-conservation, survival strategies, Sri Lanka, wetland.

Figure 1.1


MUTHURAJAWELA WETLAND WITH RESEARCH AREAS
N
Negombo
Negombo lagoon islands
Bandaranaike International Air Port
Muthurajawela marsh
Ja-Ela
Ragama
Awarakatuwa resettlement area
Sanctuary Boundary
Road
Main Road
Minor Road
Railway Line
Landuse
Boggy Area\Marsh
Lagoon
Mangroves
Reclaimed Land
River\Oya
Stream\Channel
6
0
6 Kilometers
Prepared by: GIS Centre / R&SP Unit / CEA 2001

1 Introduction

The objective of this study was to gain insight into the ways in which vulnerable households in a sensitive wetland environment maintain their livelihoods, well-being and health. An attempt is made to show the interrelationship between conservation of the ecosystem and human development. The author of this thesis hopes to contribute to a better understanding of the problems of people living under marginal conditions. An improved knowledge base on livelihood strategies will help planners and others involved in nature conservation and development projects make better informed decisions.

This chapter presents a short introduction to the Muthurajawela wetland and the people living in it. It also lists the research questions, and presents an outline of the subsequent chapters.

1.1 The marsh and lagoon communities

Muthurajawela wetland is situated along the west-coast of Sri Lanka close to the capital Colombo. The area around the wetland is densely populated and economically important to Sri Lanka. Human encroachment in the marsh and the lagoon area takes place because of poverty and the absence of suitable alternative places to live. An estimated 800 families live in different settlements in the marsh area. On the channel islands of Negombo Lagoon the number of families is estimated to exceed 3000. A resettlement village founded in 1994 in the southern part of the marsh, counts around 240 families (Figure 1.1). The majority of the Sinhalese and Tamil inhabitants in the wetland area are adherents of the Roman Catholic Church. About 90 percent of household income is spent on food, while the national average is 65 percent (CEA 1994). For the Negombo area, fishing at sea and in the lagoon provide the main source of income.

Traditional sailing vessels in the channel of Negombo Lagoon.

1.2 Ecological context

Muthurajawela wetland has a great potential for both people and nature. The total economic value of the estuarine system was estimated in 1990 to be more than one billion rupees (US $ 20 million) annually. The ecosystem, however, is under severe stress because of population pressure, pollution, and destructive fishing methods.

Conservation measures
Conservation of ecosystems and human development are two important global concerns that often tend to conflict with each other. Matching conservation with sustainable use of the wetland is one of the most difficult and least tested aspects of environmental management. To protect Muthurajawela wetland for economic, ecological and cultural reasons, the government of Sri Lanka instructed the design of a master plan for the development of the marsh and the lagoon. The plan was approved by the government in 1993. However, the local people at Muthurajawela wetland were afraid to become the victims of this development. Following the demands of the communities, the Central Environmental Authority prepared a follow-up program which was called the Integrated Resources Management Program in Wetlands (IRMP). IRMP became reality in January 1998. The human development component of the IRMP in Muthurajawela is discussed in Chapter 13. The long-term objectives of IRMP are:

- *To preserve Sri Lanka's natural resources (wetland) in order to safeguard the country's biological and ecological diversity and natural heritage.*

- *To alleviate poverty among communities dependent upon depleting natural (wetland) resources through wise use of such resources.*

- *To strengthen the capacity of the agencies and communities involved in resource management.*

1.3 Conceptualisation

Few studies have examined the relationships between human communities and nature conservation. An important report from the Institute of Development Studies in Sussex on poverty and environment (Forsyth et al. 1998) challenges the conventional view that poverty and environmental damage re-enforce one another leading to a downward spiral. In other words, poor people are forced to degrade landscapes in order to survive. In that view, it is further assumed that the only way to avoid environmental degradation is to alleviate poverty. The IDS report presents a number of case studies showing that for their livelihood, poor people adopt protective mechanisms to minimise the impacts of demographic, economic and environmental pressure.

The concepts of livelihood and well-being are central concepts in this thesis. Livelihood is defined as having adequate stocks and flows of food and cash for leading an active and healthy life. In planning and carrying out activities, people use a variety of strategies. Livelihood security and well-being (including physical and mental health) are the desired outputs of these activities. To achieve these outputs, inputs are needed. These are *resources* and *assets*. The analysis of livelihood and well-being in this study takes the household as the level of analysis.

Given the poverty of the marsh inhabitants and the exposure to an unhealthy environment, one could expect many health problems. The issue of health is an important part in this study. Regarding health, an approach was used that distinguishes the outsiders' perspective (*etic*) and the perspective of the people themselves (*emic*). Emic is the anthropological term for the point of view of the self (actor or patient) to which the concepts 'illness' and 'healing' can be applied. Etic is the more scientific or the outsider approach, to which the terms 'disease' and 'curing' belong, as they refer to classifications and practices of biomedical scientists and healthcare professionals.

1.4 Research questions and set-up

The central research question of this study was formulated as follows:

> *How do vulnerable households in a wetland environment use and manage their resources and assets to maintain the health and well-being of their members?*

Based on this, the following more specific research questions were identified.

Questions

1. What resources and assets do vulnerable households in the wetland have? How are these used, and how does access to and use of resources and assets differ according to gender?

2. How are the accessibility and accumulation of resources and assets constrained by the characteristics of the environment? What strategies do men and women use to overcome these constraints in generating their livelihood?

3. What are the emic views on causes and prevention of illness in the wetland, and what etic factors contribute to or protect against disease?

4. What is the role of the institute responsible for the conservation of the wetland resources in assisting people to overcome poverty and reduce the pressure on the natural environment?

Research set-up

A distinction is made in this research between the Negombo Lagoon area and the Muthurajawela marsh area. The latter includes a resettlement village in the southern part of the wetland. The majority of the population at the lagoon islands lives from fishing, whereas the swamp is inhabited by people with more varied socio-economic backgrounds. Data collection took place on a regular basis between November 1998 and May 2001. Besides a study of the literature, quantitative and qualitative data were collected. The author conducted two household surveys and a small survey on nutrition among wetland inhabitants. In addition, disease records from hospitals in the area have been copied to get a general impression of morbidity patterns in the area. Qualitative data were collected through in-depth interviews with key-informants, marsh dwellers, and through participant observation. Pictures were taken to give an extra dimension to the written information and to make the thesis more attractive. To use the words of Evans-Pritchard (1937: 254):

> *"I find the usual account of field-research so boring as often to be unreadable,[...] every sort of system, structure and function, but little flesh and blood. One seldom gets the impression that the anthropologist felt at one with the people about whom he writes. If this is romanticism and sentimentality I accept those terms."*

1.5 Structure of the thesis

In Chapter 2, relevant background information is given for readers not familiar with Sri Lanka, on topics such as population, land tenure, economy, and health. For those who have little knowledge of wetlands, Chapter 3 explains the definition of wetlands and the international agreement on the conservation of these areas. It also gives information on management of Asian wetlands in general and wetlands in Sri Lanka in particular. In Chapter 4, concepts relating to survival and livelihood are worked out. The chapter also offers an anthropological explanatory model in which livelihood is related to health and environment. Chapter 5 presents the different methods used to obtain the data presented in this dissertation and gives the time schedule of the research.

Chapter 6 presents the research area, starting with an outline of the historical background of Muthurajawela. Then, an overview of the characteristics of and the conservation activities in the wetland is given. Chapter 7 describes the swamp area and the people that live there, including the people in the resettlement village of Awarakatuwa. In 1994, the settlers were forced to leave their previous village and move to a sand-filled mixed urban zone newly created in the wetland. Chapter 8 describes the Negombo Lagoon area and the communities living on the islands in the channel segment of the lagoon. As said, the background of the people that live here as well as the geographical features of this area are different from those of the marsh proper. Examples of both sea and lagoon fishing methods are described in this chapter.

Ja-Ela river.

Chapter 9 presents the data on the livelihood systems of the households involved. It includes information on household resources and assets as well as on debts and on certain illegal livelihood activities in which some people in the wetland are involved. The chapter also explains how people deal with periodical floods. Chapter 10 focuses on the livelihood struggles of women, and presents some examples of women who worked abroad. Chapter 11 starts with a short introduction on how in the past wetlands were viewed by westerners. Data are presented concerning public health issues in the wetland and current scientific (etic) views

on marsh-related diseases, including alcoholic diseases, are discussed. Chapter 12 contains data on health and illness obtained from the wetland dwellers themselves (emic view). Two examples of traditional (healing) alternatives for people in the wetland are presented as well.

Chapter 13 discusses the linkages between human development and nature conservation. An approach that aims at integrated resource management in which biodiversity preservation and sustainable development are combined is relatively new. The IRMP project in Muthurajawela is one example and it is therefore important to learn how the project assists the inhabitants in their struggle to survive in the wetland. Some information is given on how the project creates public awareness on environmental issues. The research questions and their conclusions are presented in the relevant chapters, while the final discussion takes place in Chapter 14.

2 General Information on Sri Lanka

Sri Lanka is a tropical island, located south-east of India. It is about 430 km long and 225 km wide at its maximum and has a coastline of about 1770 kilometres. The country can be divided into a wet and a dry zone. The wet zone in the south-west of the country is affected by two monsoons; the south-west monsoon from May till July and the north-east monsoon from October till January. The dry zone only benefits from rain during the north-east monsoon. Sri Lanka is an agricultural country with rice cultivation in flooded rice fields as the main agricultural activity. The central highlands have a cool climate, which allows the cultivation of rubber, spices and tea. Coconut palms are abundant in the lowland wet zone and along the coast. Sri Lanka is divided into eight provinces and subdivided into 25 districts and 280 divisions.

2.1 Population and ethnic groups

In 1948 Sri Lanka had a population of seven million. The average population growth rate was 2.3 percent annually between 1963 and 1972, declining to 1.5 percent in the 1990s. This resulted in a population of about 18.5 million in 1998. The population density is about 280 people per square kilometre, which is one of the highest in Asia. About a third of the population is under the age of 17 and over 9 percent is under the age of five. The total fertility rate (TFR) is estimated at 2.09, which is low for the South Asian region. There are 23 births per 1000 women aged 15-19. The contraceptive prevalence for any method was 66 percent and for modern methods 44 percent [1] (UNFPA 2001).

The presence of different ethnic groups in Sri Lanka, each with their own language and religion, presents a complicated picture and has caused many problems. The problems between the Sinhalese and the Tamil inhabitants are the cause of the prolonged armed conflict in the country. The Sinhalese constitute about 74 percent of the population, they speak Sinhala, and are mainly Buddhist. The Tamils originate from South India and are the second largest ethnic group, constituting about 18 percent of the population. They speak Tamil and are predominantly Hindu. A minority of the Sinhalese and Tamil population is Roman-Catholic. Muslims comprise about 7 percent of the population and they are sometimes called Sri Lanka Moors; most of them speak Tamil. The majority of the Muslims are descendants from Arab or Indian Muslim traders (Niven et al.1996).

Finally, the Veddhas and the Burghers must be mentioned. The Veddhas are thought to be descendants from hunters and gatherers from Africa and Australia. Formerly they lived in the remote jungles of the country but in the past half-century they have assimilated with the Sinhalese and the Tamils. The Burghers are descendants from mainly Dutch but also from Portuguese and British colonial citizens. English is widely spoken in Colombo and in the tourist areas, but not in the rest of the country.

2.2 Political history and the government

Sri Lanka gained independence in 1948 after a long period of western colonisation, and was called Ceylon until the 1970s. Until ten years after its independence, English remained the national language and the country continued to be ruled by an English speaking elite. After indipendence the political scene was dominated by the United National Party but in 1956

[1] Proportion of married women (including women in consensual unions) using methods of contraception.

Solomon Bandaranaike of the opposition Sri Lankan Freedom Party (SLFP) came to power after general elections. This started a period of Sinhalese nationalism, and 'Sinhala only' legislation was introduced. This policy triggered the conflict between Sinhalese and Tamils.

After the assassination of Bandaranaike in 1959, his widow, Sirimavo Bandaranaike became the leader of the Sri Lanka Freedom Party (SLFP). She was the first female prime minister in the world. Sirimavo Bandaranaike continued her husband's program of nationalisation and tried to bring private schools under state control thereby further alienating the Tamils as well as Roman Catholics. In the 1970s, mainly left-wing Tamils started an armed opposition to establish an independent Tamil state, *Elam*. The largest of the many rebel groups was the Liberation Tigers of Tamil Elam (LTTE). In the meantime another group led by Singhalese Marxist oriented students started a violent rebellion to protest the lasting economic crisis. This group, called JVP, was crushed by the army at a cost of many thousands of lives.

For some time, the UNP and the SLFP were alternately in power. In 1977, the UNPs prime minister, J.R. Jayawardene tried to reverse the nationalisation programs and opened the country for tourism, foreign import and investment. In this period a free trade zone, north of Colombo, near Katunayake airport, was established. Furthermore, the government gave Tamil the status of a national language, but the existing differences and animosity between Sinhalese and Tamils continued. His successor, Premadasa, was assassinated in 1993.

After narrowly winning the parliamentary elections in 1994, the Peoples Alliance (PA), a coalition of the SLFP and smaller parties, and the UNP were preparing for the presidential elections when a LTTE suicide bomber killed Gamini Dissanayake, the candidate for the UNP. The PA, for which Chandrika Bandaranaike Kumaratunga was presidential candidate, won the elections. The President, who is the daughter of Solomon and Sirimavo Bandaranaike, stated that her most important mission was to end the civil war.

Government

The central government consists of a president, a prime minister, the cabinet ministers and the deputy ministers. The president is elected for a period of six years and has the power to appoint or dismiss members of the cabinet, including the prime minister, and to dissolve parliament. After general elections a cabinet is formed and the various departments are divided between appointed cabinet ministers.

In Sri Lanka it is common for a minister to head more than one ministry or department, which gives rise to combinations such as the Ministry of Transport, Environment and Women's Affairs. In addition to the departments there are a number of authorities that operate more or less independent like the Central Environmental Authority (CEA) or government corporations like the Sri Lanka Land Reclamation and Development Corporation. These agencies are responsible to a certain minister but are different from departments in terms of funding, instruments and structure.

The PA became the ruling party in coalition with the SLFP, the DUNF (a split of the UNP), the Sri Lanka Muslim Congress, the Ceylon Workers Congress, the Lanka Sama Samaja Party and the Communist Party of Sri Lanka. Pressure groups in the country are, among others the LTTE, various Sinhalese Buddhist groups, and the labour unions.

Law

The legal system in Sri Lanka is a mixture of English common law, Roman-Dutch, Muslim, Sinhalese and customary law. Below the Supreme Court, the Court of Appeal and the High Court, there are numerous district courts, magistrate courts and primary courts. The 22 electoral districts in the country have an appointed district minister as head. The three levels of local authorities are: the Municipal Council, the Urban Council and the *Pradeshiya Sabhas* (village or town councils).

2.3 Economy

Before independence, economic activities were concentrated on producing a limited number of commodities, which were tea, rubber and coconuts. After independence other products like leather, textile and garment became more important, but tea remained a major export product. In peaceful times, tourism is a big foreign currency earner. In 1994, over 400,000 tourists visited the country. Sri Lankans working abroad, especially in the Middle East, have become a significant economic force, sending home about US$1.5 billion annually (Niven et al.1996). Since 1977 the government has followed a liberal economic policy by opening up opportunities for private enterprise and foreign investment.

By 1985, Sri Lanka was more or less self-sufficient in rice production, the main staple food. Foreign aid is important despite complaints from donors about the country's human rights record. Living conditions for the average Sri Lankan remained at a very basic level. The major problem for economic development is the civil war, which absorbs about 20 percent of the government expenditure. For the year 1999, per capita income was US $820, while inflation was officially estimated at 10 percent (UNICEF 2001).

2.4 Education

Shortly after the second World War, free education from pre-school to university was introduced and state education remains free to this day. There are also many private institutions. Good education is highly valued, which is reflected in the high literacy level in the country. The adult literacy rate[2] between 1995 and 1999 was 92 percent for men and 88 percent for women. The gross secondary school enrolment ratio[3] for the period 1995-1999 was 71 for men and remained high for women with 78 (UNICEF 2001). Today there are eight universities in Sri Lanka, including an open university in Colombo, and there are many post-graduate institutions. Teaching is in Sinhalese, Tamil and sometimes in English.

2.5 Health

In Sri Lanka, western, ayurvedic, unani, siddha and homeopathic systems of medicine are practiced. Of these, western medicine predominates. Healthcare is provided by public as well as private health services. The public sector provides healthcare for about 60 percent of the population, including the entire range of preventive, curative and rehabilitative healthcare. The private sector consists of practitioners of all types of medicine and provides mainly curative care.

[2] Adult literacy rate: percentage of persons aged 15 and over who can read and write.

[3] Gross secondary school enrolment ratio: the number of children enrolled in secondary level, regardless of age, divided by the total population of the age group which officially corresponds to the same level.

Health institutions
A network of curative care institutions exists, ranging from sophisticated teaching hospitals to small dispensaries. In most areas a free government western type of health care service is available within a distance of 5 km of a person's home (MOH 1999). There are three levels of curative care institutions administered by the Ministry of Health.

- The central dispensaries, maternity homes, rural hospitals, peripheral units and district hospitals are primary healthcare institutions.
- The base and provincial hospitals are secondary care institutions.
- The teaching and special hospitals are tertiary care institutions.

There is about 1 doctor per 4000 people in the year 1995 compared to, for example, Pakistan, where there is 1 doctor for 2000 people. The State Pharmaceutical Corporation is the sole supplier of medicines, surgical items, medical equipment and chemicals to the Ministry of Health, and is the largest importer of pharmaceuticals. There are over 1000 private pharmacies in the country, more than 50 percent of which are located in the Colombo and Kandy District (Arjuna 1997).

Morbidity and mortality
Although data are not entirely reliable, Sri Lanka remains a rare example of a low-income country that has been able to achieve relatively high levels of social welfare. Among other things, this is reflected in a high life expectancy (74 years in 1999), low infant mortality[4] (17 per 1000 live births in 1999), and high rates of school enrolment and literacy, as mentioned in the section on education (UNICEF 2001).

In 1996, the leading causes of hospitalisation were traumatic injuries and respiratory diseases. The main causes of death were heart diseases and gastrointestinal infectious diseases. It is noteworthy that 80 percent of the diseases of the gastrointestinal tract were among males. Of these, cirrhosis and other liver diseases accounted for 95 percent of male deaths, mainly in the age group 45-49. Suicide and self-inflicted injuries were the second leading cause of mortality in the age group 15-49. The leading cause of death in this age group was homicide and injury purposely inflicted by other persons. The war victims are counted separately.

Drugs and alcohol dependency, chronic mental disorders, sexual disorders, child abuse and suicide are on the increase and are a major problem in Sri Lanka. During the year 1996, over 27,000 cases of snakebites were treated in government hospitals (MOH 1999). There are specialised campaigns and programs for the control of malaria, Japanese encephalitis (JE), filariasis, STD/AIDS[5], rabies, and leprosy. Dengue is common in urban areas and its complications can be fatal.

Child health
An average of 85 percent of the total number of registered live births occurs in governmental medical institutions. The under-five mortality rate (U5MR) for Sri Lanka in 1999, was 19 per 1000 live births and ranked 135 in the list of countries (UNICEF 2001)[6]. Although survival is high, low birth-weight and under-nutrition are prevalent among children of school-going age.

[4] Infant mortality rate - probability of dying between birth and exactly one year of age expressed per 1000 live births.
[5] Sexually Transmitted Diseases and Acquired Immune Deficiency Syndrome.
[6] Compared to e.g. Pakistan ranking 33 with 136 deaths per 1000 live births, or the Netherlands ranking 175 with 6 deaths per 1000 live births.

About 30 percent of the paediatric hospital beds are occupied by children with diarrhoea. This is related to the high level of malnutrition, unsafe drinking water, improper excreta disposal, and poor personal hygiene. Universal child immunisation with BCG, DTP, polio and measles has been achieved. However, there is a resurgence of malaria due to resistance of the parasites against commonly used drugs and resistance of mosquito vectors against insecticides. Malaria is a threat to the life of children.

Ayurveda
Ayu means life and *veda* means science or knowledge. Ayurveda is divided into three main branches which deal with life, growth and diseases of humans, animals, and plants. Ayurveda was the basis for many systems of medicine in the south-east and far-eastern Asian regions. According to the Ayurveda Act of 1961, ayurveda incorporates the siddha system (the dravidian system which is popular in South India and Jaffna, Sri Lanka), the unani system (Greco-Arabic system) and the indigenous system of medicine. Other Asian systems of medicine can also be categorised under ayurveda. The Department of Ayurveda, established in 1956, at present functions under the Ministry of Health and Indigenous Medicine. There were 42 ayurvedic hospitals in Sri Lanka in 1997 and many dispensaries. In 1995, three ayurvedic colleges were established, of which the Gampaha Siddha Ayurvedic College was affiliated to the Kelaniya University, situated just north of Colombo.

2.6 Land tenure

Colonial period
In the past, land in Ceylon was owned by the king, who allowed the people to use it and also donated areas to chiefs and to temples. During the colonial period, the Dutch introduced the Roman-Dutch law system. A drastic ordinance was introduced in 1840 (Waste-land act) to enable the colonial government to gain more control over land. Many peasants, who could not prove ownership of the *chenas*[7] which they had been occupying for generations, lost it to the crown and became landless. The peasants could only regain access to their land by paying tribute to the *mudaliyar*[8], a revenue officer with far reaching powers. The system allowed the revenue officer to relocate land and to adopt the role of a traditional feudal aristocrat (Risseeuw 1988).

The colonial government tried to set up a land registration system but only a part of the system was implemented, due to lack of money and time. It was stated that every issue relating to land must contain an accurate and clear description of the land involved. Maps, however, were not obligatory, so identification remained difficult. In 1935, the land development ordinance was introduced which stipulated that land belonging to the state should be mapped. It was also made compulsory to indicate whether the land was meant for development, to be used by individuals, or for other purposes. In 1947, the crown-land ordinance was introduced, which gave the government more control over state land and dealt with the protection of special areas like reservations. At present, a larger part of the state land has been mapped, but the information is incomplete and the accuracy is questionable (Arjuna 1997).

After independence
After independence, the number of landless people increased and the settlements enlarged along with population growth. Many people could not afford to buy a piece of land so they

[7] Small plots of land, which were cultivated for one or two years and then left to regenerate.
[8] A mudaliyar was an influential man on whom many depended for work, loans and other kind of assistance.

encroached on crown-land, which became a growing problem for the government especially in Colombo and surroundings, where an influx of people from other parts of the country took place. There is no legal sanction against a person who settles illegally on state land but the state remains the owner of the land. The consequence of settling on private land can even be more beneficial for the encroacher, because if the owner does not order the person off the land within a period of ten years, he or she automatically becomes the owner (Molenaar and De Muynck 1992).

Settlers in Muthurajawela marsh.

Land registration

Generally speaking, the land registration system in Sri Lanka is not very transparent. Systematic registration based on a cadastral survey has not yet become law, but is in the planning. The Survey Department is the principal agency for carrying out surveys on alienated state land, but information on encroachment is available at different institutes. Other primary sources of information on land-ownership are the Land Commissioners Department, Irrigation Department, Forest Department, Department of Agriculture, Mahaweli Authority of Sri Lanka, the Central Bank, and the Department of Census and Statistics and the various institutions dealing with tea, rubber, coconut and sugar (Arjuna 1997).

Several authorities report very high percentages (up to 70 to 80 percent) of the land to be owned by the state, but the real situations are very different. If a surveyor wants to measure a piece of crown land, he asks the people that use the land what the borders of the parcels are and uses this information for surveying. This ignores the real situation and does not show how much crown land there is still available. People who encroached in critical areas such as stream reservations, beaches and railway tracks cannot be easily removed.

3 Wetlands

For the readers not familiar with this topic, this chapter starts with a definition of wetlands followed by a historical view on marshes. Global concerns on wetlands and how these areas should be dealt with are also discussed. Providing some general knowledge on wetlands is important because Muthurajawela is a wetland conservation area and most dwellers are illegal residents.

Wetlands are places that are temporarily or permanently covered with water. The Ramsar[9] Convention defines wetlands as:

> *"Areas of marsh, fen, peat-land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six meters*."

There are many other definitions of wetlands in use throughout the world but the Ramsar definition is the most often used, because it is broad and captures the widest possible range of ecosystems that could be regarded as wetlands.

Freshwater marshes develop along the shallow parts of lakes and rivers. They are formed when ponds and lakes become filled with sediment. Salt marshes occur on coastal tidal floodplains. An estuary, like at Muthurajawela, is a semi-enclosed coastal area where saltwater mixes with fresh water from rivers. Aquatic life in the estuary is dependent on salinity levels, which decreases from the open ocean to the mouth of the inflowing rivers. When salinity declines, the diversity of life also declines, because most estuarine organisms have a marine origin.

3.1 Changing views on wetlands

In western cultural traditions, marshes have been given a negative evaluation and have been disliked because of humidity, noxious insects and poor agricultural use. They have often been looked upon and treated as hostile places for such a long time, that their conservation seems almost a cultural contradiction.

Since 1492, when Columbus and his men arrived in America, explorers have been visiting every corner of the globe searching for land to serve the developing states of Europe. The Europeans considered the marshes, floodplains and other wetlands to be disease-infested, and obstacles to development. Later, the agricultural and industrial revolutions not only changed the social, economic, and political face of Europe and ultimately the world, but they also set into motion a process of ecological change and devastation.

Wetland degradation through hydrologic intervention by man has occurred historically through actions such as: drainage, dredging, stream channelling, ditching, deposition of fill material, stream diversion, and groundwater withdrawal. Europe, during the 1600s, was not the first civilisation to modify natural wetlands. Over much of Asia, a diversity of cultures have been built upon the control and exploitation of wetland systems in their region. The civilisations of the Indus Valley and Angkor in Indochina drew much of their economic strength and stability from the efficient manipulation of the Indus and Mekong rivers (Dugan

[9] The convention on wetlands was held in Ramsar, a small city on the shores of the Caspian Sea in Iran.

1993). Some people controlled water through dikes and dams, while others exploited the annual cycle of river floods and adopted to their rhythm by, for example, building their houses on stilts.

Colonisation, the establishment of settlements and the foundation of cities, is often tied to the drainage or filling of wetlands. Some cities, such as St. Petersburg, were built on land reclaimed from marshes, whilst some colonial settlements in wetlands grew into cities, such as Perth (Giblett 1996).

The experts that drained parts of the Netherlands were considered national heroes, enabling people to grow grain where once reeds dominated. They made dikes around shallow waters and turned the beds into reclaimed agricultural land, known as *polders*. In Britain and France, similar investments were made in channelling the major rivers. Furthermore, large areas of wetland have been drained in an attempt to eradicate malaria, particularly in parts of Europe (for example the Pontine Marshes near Rome) and the United States. The anopheles mosquito, the vector for this disease, breeds in fresh and brackish water of wetland areas.

Wetlands have important natural functions such as flood control, water purification and coastal protection. They are productive places for activities like fisheries and tourism, as they often have unique scenic landscapes. Wetlands have always supported a high biological diversity, including humans. Some societies use wetlands as a cheap sewer or as an industrial area, others reclaimed wetlands to serve as nature parks or arable land.

The aesthetic quality of lakes, rivers and lagoons is gaining increasing recognition by many people. Boating, watching birds or just appreciating the wide watery landscapes, sometimes with islands, attracts ever more people. The scenery also attracts individuals from outside who like to explore picturesque areas and its people, like Wilfred Thesiger, the well-known western explorer of the marshes in southern Iraq. He recalls memories of his first visit to this area in 1951, in his book "The Marsh Arabs"; he writes:

> *"Five thousand years of history were here and the pattern was still unchanged [...] canoes moving in procession down a waterway, the setting sun seen crimson through the smoke of burning reedbeds, narrow waterways that wound still deeper into the Marshes. A naked man in a canoe with a trident in his hand, reed houses built upon water, black dripping buffaloes that looked as if they had calved from the swamp with the first dry land. Stars reflected in dark water, the croaking of frogs, canoes coming home at evening, peace and continuity, the stillness of a world that never knew an engine"* (Thesiger 1994: 21).

Landscapes are often important to the local communities as part of their traditional way of living. They value such sites for cultural, spiritual or religious reasons. Religious beliefs of traditional people are integrated in their daily life and not immediately visible to outsiders. Therefore, from the inhabitant's point of view, it is difficult to compensate for the loss of a wetland site. Australian aborigines, for example, believe that in the past important events took place in their habitat and that, in their view, the landscape tells a story (Williams 1998).

3.2 Wetland loss

The loss of wetlands world-wide, which some specialists estimate as being in the order of 50 percent, is largely a consequence of human interventions (Dugan 1993). Wetlands are

threatened by air and water pollutants and by activities like hydrological alteration, urbanisation, industrialisation, agriculture, timber harvesting, and mining. Many wetland regions have been destroyed because society viewed their disappearance as either a good thing in itself or as a small price to pay for the benefits expected from wetland conversion. Today, such policies are increasingly condemned as short-sighted, and as being socially and economically indefensible.

> In the UNITED STATES alone, some 54 percent of wetlands that once existed, are believed to have been lost. Taking the nation as a whole, 80 percent of wetland loss has been to agriculture. For 200 years, the conversion and destruction of wetlands was actively encouraged by the United States federal government. In 1763, George Washington set up a company to drain the so-called Great Dismal Swamp of Virginia and North Carolina, and convert it to agricultural land. Although that particular scheme failed, the nation's attitude towards wetlands was set. States were encouraged to carry out drainage projects and destroy the mosquito-invested wetlands (Dugan 1993).

Almost every wetland in the world is subject to some form of exploitation by people. Some of the wetlands products are sold, such as fish, crops, meat and skins from herds. Wetlands are dynamic ecosystems, and any form of utilisation or management will affect their natural balance in some way. In Asia, which supports almost 60 percent of the world's population, such exploitation is often very intense. But positive functions (values) of wetlands, like services such as water purification and flood protection, do not have identifiable markets. Because these values are 'free goods' they tend to be ignored in the economic calculations. Development in certain Asian countries occurs at high speed. Many of these nations still depend heavily on their natural resources which has led to an increasing claim on scarce resources such as water, soil, and timber.

Action programs to save wetlands from over-exploitation for commercial, agricultural, residential and industrial use, and increasingly as dumping grounds for waste, are considered necessary. If no actions are taken, many critical ecosystems would be damaged beyond repair in the near future and the people who depend on them will suffer along with other species.

3.3 Ramsar Convention and the wise use of wetlands

The international conference on wetlands was convened in 1971 in Ramsar, Iran. The so-called Ramsar Convention is an intergovernmental treaty, which sets the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources. There are presently 114 contracting parties to the convention, with 977 wetland sites of which many are of international importance and therefore on the 'Ramsar list' (www. Ramsar.org, accessed in 1999). The call for 'wise use' of wetlands has become the central concern for member states of the Ramsar Convention, as many people depend on wetlands for their livelihood, as well as for recreation and scientific research. The Wise Use Working Group was established after the Ramsar Convention. The group proposed a new set of criteria, allowing for socio-economic values to be considered in the evaluation of the importance of wetlands (M. Moser 1993).


LOCATION OF WETLAND SITES OF
REGIONAL & NATIONAL IMPORTANCE
N
District Boundary
Railway
Trunk Road
9 30
9 00
8 30
8 00
7 30
7 00
6 30
6 00
80 00
81 00
82 00
20 0 20 40 60 80 Kilometers
Source: Wetlands Atlas of Sri Lanka - CEA
Prepared by: GIS Center/R&SP Unit/CEA/2001

Figure 3.1

3.4 Wetlands in Sri Lanka

Sri Lanka became a Ramsar Convention member state in 1991 (CEA 1994). Sri Lanka has about 45 lagoons, which are linked to 101 river basins. The directory of Asian wetlands considered 41 wetlands in Sri Lanka to be of national importance, but only Bundala National Park is listed under the Ramsar Convention as a Ramsar site, a wetland of international importance.

> BUNDALA PARK, located along the south coast of Sri Lanka, includes five shallow brackish water lagoons and has an important population of water birds, elephants, turtles and other wildlife. The brackish water lagoons serve as nurseries for shrimp, fish and a variety of other marine organisms. There are a number of ancient tanks used for irrigation in the Kirindi Oya scheme. After new irrigation schemes were built to irrigate more land, the ecosystem in the park was severely affected. Salinity of the lagoons has dropped due to inflow of upstream irrigation water, which has influenced the food supply of water birds and caused many other ecological changes. Some of the lagoons have now been converted into freshwater lakes (Van der Hoek 1998).

In addition to the 41 Sri Lankan wetlands mentioned in the directory, a national group of researchers later listed 35 more wetland sites of national importance. This means that a large part of Sri Lanka is wetland. The 22 different types of wetlands in Sri Lanka are listed in Appendix 1.

Some common problems faced by Sri Lankan wetlands are: upstream flooding, over-utilisation of water, siltation, over-fishing, destruction of vegetation, landfill, sand and coral mining, pollution, water weeds and disease (Arjuna 1997). Relevant laws are diverse and remain the responsibility of separate agencies. Although policy makers now recognise that 'wetlands are no wastelands', illegal garbage dumping still takes place like in Bellanwila–Attidiya wetland.

> BELLANWILA–ATTIDIYA marsh is a wetland close to Colombo. It has the capability to absorb flood waters from the surrounding residential areas and is also the breeding ground for endangered species of plants, fish and birds. This wetland is illegally being filled by one of the nearby Municipal Councils according to the residents in the area and confirmed by environmental protection organisations. In 1990, this marsh was declared a sanctuary by the Department of Wildlife Conservation and also identified as an education zone. Despite the laws and regulations drawn up to protect Bellanwila-Atthidiya wetland, the place has become a dumping ground for sewage, industrial effluents and municipal garbage. This has become a threat for the residents and the flora and fauna in the area. Only 40 percent of the bird population is left and only 18 percent of the fish population. The mass scale garbage spot attracts crows, flies and mosquitoes. Crows and cattle-egrets, harass, attack and kill other birds. They also eat eggs and the young of other birds (Sryananda 1999).

The overriding problem in Sri Lanka is pressure on land. In the past twenty years, a large-scale population shift to the coast took place and now 32 percent of Sri Lanka's inhabitants live in a coastal belt of 50 km length. Land-use planning has become more complex because it is done by different agencies, which have environment and development responsibilities (Appendix 2 presents the parties in Sri Lanka involved in steering wetlands).

4 The Conceptual Framework

In this chapter the conceptual framework is presented with 'livelihood' as the central concept. This concept currently dominates the discourse on household poverty (Ellis 2000). Within the livelihood context, also concepts on health, gender and integrated nature conservation, are presented and discussed. First it is described how the concept of 'survival strategies' evolved and changed into 'livelihood strategies'. Related issues are described such as livelihood vulnerability and sustainability; the household production of health; and the difference between coping and livelihood strategies. Next, the anthropological concepts emic and etic are utilised in a matrix in which they are related to health and environment.

4.1 Emergence of livelihood as a concept

The concept of livelihood is thought to provide a good tool for understanding problems and behaviour of poor households and low-income groups. Throughout the debate about poverty and low-income households, different analytical concepts have been used. First, there was the concept of survival strategy. It referred primarily to ways in which people in distress dealt with their situation in order to survive. The concept was used for the first time in 1973 by Duque and Pastrana (in Conradi 1988), who analysed the survival strategies of the inhabitants of two suburbs in Santiago, Chile. They defined *estrategia de supervivencia* as the specific actions, mechanisms and behaviour of those groups in Latin American that could not derive a stable income from the industrial sector in the capitalist system. The definition addressed purely economic aspects of survival. The phrase *estrategia objectiva de subsistencia economica* seemed to imply that the people were not always conscious of their chosen strategies. In their operationalisation of the concept, Duque and Pastrana put emphasis on the economic participation of household members in activities aimed at survival. The word household was selected to indicate the context within which survival strategies evolve and are implemented.

In 1977, Lomnitz (in Conradi 1988) introduced the concept of marginality. According to him, social networking was an important aspect of survival of the lower classes. Because of their weak position in the labour market, poor individuals do not have much to fall back on; they have no savings and no social securities. According to the theory of marginality, marginal groups are looked at from the perspective of their functioning in the periphery of the capitalist system. The theory represents a macro-level approach. The analysis of survival strategies, on the other hand, focuses on what (the members of) households do to survive, and such analyses were done at the micro level. In the Latin American neo-Marxist context, marginality was not seen as an isolated phenomenon but was placed in historical perspective. Anyhow, it was the first time that marginal masses were recognised and identified as actors. Before, they were just seen as passive victims of capitalism.

In 1978, new dimensions were added to the concept of 'survival strategies'. PISPAL (Programa de Investigaciones Sociales sobre America Latina) added two aspects to the existing definition. First, the concept was also applied to better-off households. Second, biological reproduction was seen as an important labour resource. Human resources came to be seen as having a bearing on household potential and old-age security. Torrado reached the same conclusion, but gave the term survival strategies a different twist. On the basis of an inventory of behavioural patterns in working class families, she coined the term family livelihood strategies: *estrategias familiares de vida* (Conradi 1988). To bring clarity to the terminological confusion, in 1981 a conference was organised about survival strategies. It was realised that the concept had become unworkable if it was used for every household. It was

clear that survival strategies were arrangements of low-income households in an attempt to overcome problems, and it was observed that the concept had better be used for adaptations of households in response to a structural crisis situation (Rodriquez in Conradi 1988). Subsequently, other concepts were introduced, like existence strategies, live strategies and even live projects, before the term livelihood strategies gained wide currency.

4.2 The livelihood framework

Livelihood is defined by Chambers and Conway (1992) as having adequate stocks, food and cash to meet basic needs. Simply put, the means for gaining a living. Niehof and Price (2001) put emphasis on the bundle of activities that people undertake to generate their livelihood, which they call, following Ellis (1998), the livelihood portfolio. To analyse livelihood, they use a system's perspective. This implies that one has to look at the whole system of inputs, throughputs and outputs. The inputs are resources and assets. Resources are regarded as the immediate means needed for livelihood, while assets are stores of value, or claims, which can be mobilised when needed. In other words, assets can be converted into resources when necessary. The throughputs of the system are the management and strategies carried out to achieve livelihood and well-being. The latter are considered the outputs.

The livelihood system

The inputs to the livelihood system consist of different types of assets and resources. Swift (1989) distinguishes three types of household assets that can be mobilised in a crisis, depending on the sort of vulnerability. The assets are, somewhat arbitrarily, subdivided into investments, stores, and claims.

Investments:

> Human investments, including investments in education and health; individual productive assets, including animals, farming equipment, houses and domestic equipment, land trees, wells; collective assets, such as soil conservation or water harvesting works, irrigation systems, access to common property resources.

Stores:

> Food stores, granaries etc.; stores of value, such as jewellery, gold, money or bank accounts.

Claims:

> Claims on other households within the community, for production resources, or food, labour or animals; claims on patrons, big men, chiefs or other communities for help in need; claims on the government; claims on the international community.

Resources are defined by Engberg (1990) as the means to satisfy a system's demands. Some resources are tangible (concrete, visible) and others are intangible (not visible). Engberg distinguishes the following categories of household resources that are needed to generate livelihood.

Human resources:

> Psychological-, affective- and cognitive skills, and physical strength.
>
> Human resource development begins at household level and requires daily personal care throughout life. It is needed to provide productive labour.

Material resources:

> Money, land, livestock, jewellery, tools, equipment etc.
>
> Material resources may be owned by an individual, by the whole household or are available through other arrangements such as renting, borrowing, or sharing.

Environmental resources can be divided in this way:

> Resources in the physical environment: 1) *the natural environment*: soil, water, forests and animals, but also air, sunshine and wind etc. 2) *the human-built facilities*: community water supply, market places, roads, public buildings, etc.
>
> Resources of the socio-institutional environment: family and kinship networks, organisations, committees, agencies, etc. Institutional systems are created by organised groups of people who develop policies and control the use of resources through programs.

The natural environment is an important support system for all living creatures because of its capacity to absorb and recycle waste and change it into nourishment. However, there are limits to its recycling capacities. Humans can have a destructive influence on nature, and ecological systems like that in Muthurajawela can become depleted of natural resources. This in turn can change the livelihood activities of the wetland dwellers, who rely on the natural resources of the wetland.

As mentioned before, resources are sometimes kept as assets, only to be converted into resources when needed. Niehof and Price (2001) assume that people generally do not carry out activities in a haphazard way, but develop livelihood strategies according to which their activities are planned and structured. *Livelihood strategies* may be defined as the actions (or non-actions) people undertake with the intention of improving their livelihood on the longer term (see Section 4.3 below). Diversifying the livelihood portfolio can be a livelihood strategy. The same applies to migration. Livelihood strategies are part of the throughputs of the livelihood system, like decision-making and management are. Table 4.1 summarises the relevant features of the concept of livelihood system as used in this study.

Table 4.1 Livelihood system for *secure* livelihoods

Inputs	**Throughput**	**Outputs**
Resources and assets	*Household strategies*	*Household livelihood security*
Human capital and resources. Material and financial assets. Environmental resources (physical, natural, social).	Household livelihood generating activities. Resource management and diversification. Migration.	Health and well-being.
Supporting networks		

Health as output

If health is considered part of the outputs of a livelihood system, it follows that health has to be produced at household level. Berman et al. (1994) offer an integrated framework for analysing health producing processes at the household level. In this framework, health is seen as the output of household management of resources, in the same way as livelihood security is the output of the household livelihood system. The household production of health (HHPH) is defined as:

> *"A dynamic behavioural process through which households combine their (internal) knowledge, resources, and behavioural norms and patterns with available (external) technologies, services, information, and skills to restore, maintain, and promote the health of their members"* (Berman et al.1994: 206).

The health producing processes as described by Berman et al. are further discussed in Section 4.9. At this stage, it is important to recognise that people's livelihoods comprise multiple resources, processes and strategies, which may change over time.

4.3 Strategies and time

The element of time in the concept of strategy is crucial but also confusing. Dietz (1987: 15) describes the time element in the concept of crisis.

> *"The concept of 'crisis' should be reserved to periods of drops in livelihood levels (by droughts, floods, cyclones, epidemics, war, violence, price-drops produce or any other causes). Crisis are experienced as a rather severe deterioration in wealth, health and food supply, although the 'time element' is difficult to define: floods may be a one hour affair; droughts may cover two or three years […] In situations of structural extreme poverty, with a continuous threat of starvation, it is better to speak of 'misery' or 'extreme poverty' instead of 'crisis' (otherwise the crisis would often be as long as life)."*

In Streefland's paper (1987) 'Survival Strategies, Households and Kinship', produced for a conference on the same subject, no time distinction is made between strategies in case of long-term poverty and strategies in times of crisis. In his conclusion he describes the variety of survival strategies.

> *"There are, in fact, different kinds of survival problems. Some are regular and recurrent, like those related to seasonal high-tides and low-tides. Others have a permanent character and are rooted in poverty. They are related to structural inequalities in access to essential resources like agricultural land. Yet another kind of survival problems regards adverse physical conditions which are characteristic for the environment in which people live. Finally, there are problems of the sudden calamity type, for instance caused by epidemics and war"* (Streefland 1987:13).

Anderson et al. (1994: 20) attribute a long-term significance to the term 'strategy'. They define strategy as "a useful shorthand for the overall way in which individuals, and possibly collectivities, consciously seek to structure, in a coherent way, actions within a relatively long-term perspective."

The time element takes an important place in Mula's thesis (1999) as it concerns coping strategies of people living nearby the Pinatubo volcano in the Philippines and deals with the continuous and unpredictable nature of the disaster. Lahar, which is a greyish mixture of lava and sediment, moves from the mountain slopes into the villages every rainy season. It leaves the households vulnerable and in a state of uncertainty. In her study, Mula gives a fourfold meaning to time to take account of the continuous threat of the disaster. She framed her study in the light of historical time, seasonal time, daily time and life events. Mula (1999) and Davies (1993) use the term 'strategy' in combination with the concept of coping, which is somewhat confusing because coping is a short-term response to a stressful situation whereas strategies are commonly applied within a relatively long-term time perspective.

Coping (strategies)
Interest in coping strategies arose particularly after the famines in Africa in the 1980s as a means of understanding why some people survived while others did not. Coping was defined as a short-term response to an immediate decline in access to food (Davies 1993). Coping has become a popular concept in the search for tools to monitor food availability and identify appropriate interventions. Davies stresses the fact that coping strategies are not necessarily economically or environmentally sustainable.

Pennartz and Niehof (1999) note that definitions of coping are as varied as the disciplines from which coping theories have emerged. A recurring distinction in the definition of coping is problem-focused coping versus emotion-focused coping. The one does not go without the other. In case of food crisis, natural disasters or other problematic events, physical as well as psychological stress occur. Pennartz and Niehof make it clear that while "strategy should be restricted to forward-looking approaches, coping is predominantly reactive towards the stressful event or situation" (1999: 49). Table 4.2 summarises the relation between time, livelihood strategies and coping (strategies) in the situation of Muthurajawela wetland.

Table 4.2 Strategies and coping in relation to time in Muthurajawela wetland

1	**Livelihood strategies**	Life time	Livelihood maintenance and improvement on the relatively long term.	The strategies the households in Muthurajawela wetland use to strengthen their livelihood and improve their well-being.
2	**Coping strategies**	Seasonal time	Managing of a predictable or foreseeable crisis in the near future.	The coping strategies people in the marsh use during the floods that occur yearly. Households that will have to deal with insecurities, such as resettlement because of the new highway to be constructed through the marsh.
3	**Coping**	Daily time	Response to an immediate stressful situation or unexpected event.	Extremely vulnerable households in the wetland, often with a household head addicted to alcohol, cannot do much else but cope. This also applies in case of sudden calamities.

4.4 Vulnerability and sustainability

Livelihood security can be contrasted to livelihood vulnerability. Livelihood security refers to sustainable livelihoods: households that are able to provide for their own basic needs in a durable way. Livelihood vulnerability refers to households that are no longer able to provide for their basic needs. The degrees of livelihood security and livelihood vulnerability are connected to different kinds of strategies. The following typology is presented by Niehof and Price (2001:17):

- *Secure livelihood systems*, based on effective and viable livelihood strategies, which do not need coping strategies.
- *Vulnerable livelihood systems*, which need effective coping strategies to bridge difficult periods but are normally able to do so.
- *Extremely vulnerable livelihood systems*, which break down in a situation of stress because of a lack of assets and an inability to develop effective coping strategies.

According to Chambers and Conway (1992), livelihoods are sustainable when they can cope with and recover from stresses and shocks, maintain or enhance their capabilities and assets, while not undermining resources. Whether individuals or collectivities are able to make ends meet, depends on their performance with respect to their capabilities, in relation to equity and sustainability. According to Chambers and Conway, each of these concepts can be empirically observed and measured. Capability refers to being able to perform certain basic functions, to what a person is capable of doing and being. Equity can be measured in terms of relative income distribution. Sustainability in the livelihood context focuses on the ability to maintain and improve livelihoods. Chambers points out that the three concepts of 'capability, equity and sustainability' are 'our' (etic) concepts not 'theirs' (emic). In Section 4.7, the terms, emic (insiders' view) and etic (outsiders' or scientific view), which are central concepts in this thesis, will be further discussed, particularly in relation to health and disease but in relation to the environment as well.

Environmental sustainability, another crucial concept in this study, refers to the global concerns with pollution, global warming, deforestation, the overexploitation of non-renewable resources and physical degradation. Sustainability in the social context is connected to this because livelihoods (people) have to enhance the local and global assets on which they depend. Regarding environmental and livelihood sustainability, Scoones (2000) presents an overall framework for analysing sustainable livelihoods in relation to resources and strategies. Central to his framework is the analysis of the range of formal and informal organisations and institutional factors that influence livelihood outcomes.

4.5 Defining households

An important question in this study concerns the degree of vulnerability of the livelihood system of households in the wetland. The sensitive ecosystem in Muthurajawela wetland, the floods, and the social problem of alcoholism, are important factors that put many households in the marsh in a vulnerable situation. Anthropologists usually take the household or 'domestic group' as their basic unit of analysis, for the simple reason that it is the basic unit of production, reproduction, consumption, and of social, ceremonial, and political interaction (White in Binswanger et al. 1980). However, household is still a controversial concept in anthropology. Though household as a phenomenon is universal, to define it is difficult. Descriptions like "eating from one pot" or "cooking on the same hearth", or "a group of people who live together and perform certain social and economic functions", encounter problems in a specific setting (Berman at al. 1994). In advanced countries, were a household usually consists of a small alliance of which its members have social and biological relations, the term 'family' is often used for household. Allen and Crow (2001:2), in analysing the term family, note that […] "often the meaning is clear enough from the context in which the term is being used. However, in writing sociologically about family issues there is a need for greater precision in the deployment of terms." Concerning the terminology 'family' versus 'household', Chant writes that household is the preferred term in developing countries because:

> *"The members of individual residential units are often embedded within strong networks of wider family and kin and it accordingly makes little sense to confine 'family' to small domestic groups. Alternatively, people in Northern countries often have less contact with relatives beyond the immediate household or their natal families"* (Chant 1997a: 281).

In censuses in Sri Lanka and many other countries, households are defined as spatial units where members live in the same dwelling and share basic domestic and/or reproductive activities. However, households, although being everywhere the 'arena of everyday life', are far from universal in their forms and functions. Below are some examples to illustrate this:

> In the area of Mula's research in the Philippines, most parents expect their children to have a residence near them after they have married. This is important to establish reciprocal relations and in terms of material assistance and care (Mula 1999). Thus, there will be a blurred boundary between the household of the married child and that of its parents.
>
> In Madura, Indonesia, no clear households can be found. There are groups of people who share cooking facilities, which change in size and composition depending on the moment of the life-cycle, prosperity or other circumstances (Niehof 1985).This illustrates the dynamic character of households, and the fact that the boundaries of the co-resident unit and the resource-sharing unit do not always coincide.
>
> In Africa, polygamy and labour migration are complicating factors. Men who have more wives take different positions in a larger integrated household. Men who work far away often also have a household in the area where they work (Niehof 1994). In Swaziland, a patrilineal farm contains groups of women with their children, each with their own kitchen, in which men sometimes take part and sometimes do not (Russell 1993).

These examples make clear that people may be members of more than one household at the same time. Hence, household membership is not exclusive and boundaries are fluid and permeable. We may conclude from the examples above that studying households at a particular point in time could give a distorted and incomplete picture because of the many changes that take place within households over time. One way of defining the household is to use a functional approach based on specific household processes such as production, consumption, reproduction, etc. Definitions of the household unit based on functional criteria could then vary according to the survey design and questions. We take Rudie's definition as a starting-point, because of its emphasis on joint resource management for basic needs. Rudie (1995: 228) defines the household as: "a co-residential unit, usually family-based in some way, which takes care of resource management and the primary needs of its members." Another approach is to concentrate on individuals living in a specific area. Households are often part of a quarter or suburb in which households share certain characteristics, like the people living in the conservation area of Muthurajawela wetland. They share the characteristic of living illegally in a floodplain because they were too poor to afford house rent. In this study, Rudie's definition was used because of its emphasis on joint resource management for primary needs. People were counted as members of a household when they stated they belonged to it, which amounts to a subjective household membership.

4.6 Households, livelihood and gender

In general, livelihood opportunities are more limited for women than they are for men, although a growing body of research suggests that members of female-headed units are not necessarily worse-off than their counterparts in male-headed households. Female household headship may even sometimes be a positive factor for survival (Chant 1997b; Mtshali 2002). However, poor women are usually involved in low-return activities, in which gender

inequalities and bad working conditions prevail. Apart from the lack of access to finances, lack of access to resources, raw materials, markets, knowledge, and training are also serious obstructions for women.

In the discussion about the role of the household in producing livelihood and well-being, the co-operation and solidarity among household members is often assumed. Not many scientists have explicitly acknowledged the role of conflict in household production. Especially in economic literature, households are portrayed as solidarity units. Subsidies and transfers to households are assumed to have the same effect regardless of whether they are directed to men or women. Hart (1997), however, makes the point that a household is composed of self-interested individuals who engage in both conflict and cooperation. Their relative bargaining power is defined by 'threat points' or fall-back positions, depending on the current level of welfare of the household. Gender inequality is often connected to male-female wage differentials. Distribution within the household also reflects power relations within the household. In relation to this, Amartya Sen (1990: 129) points out that:

> *"The members of the household face two different types of problems simultaneously, one involving cooperation (adding to total availabilities) and the other conflict (dividing the total availabilities among members of the household). […] Differences in bargaining power between members are the product of interlocking asymmetries, […] and the ability of some members to exercise coercion, threat or violence over others."*

Household members have their own preferences and are not always maximising their joint welfare. However, studies have shown that income controlled by women is associated with larger improvements in child health and nutrition, fertility decline, and increased proportions shares of the household budget allocated to health, education and housing (Hart 1997).
According to Hilhorst and Oppenoorth (1992), in the past, many projects were based on traditional assumptions about women's roles and abilities. These assumptions focused on women as mothers and domestic workers rather than on developing women's enterprise skills. Guyer and Peters (1987) also observed an ambivalence in approaching women in development studies and projects. In the welfare approach, women are placed in the domestic sphere and the focus is on motherhood (safe motherhood and family planning projects). In a women-in-development approach, they are seen as individuals with an economically productive role, ignoring their other roles. In low-income households, women's work not only includes reproductive work (childbearing and child rearing responsibilities), but also productive work, often as secondary income earners. In addition, women are also involved at the neighbourhood level, in community managing work. Together these are referred to as the triple role of women (Moser 1989). The position of women depends on a variety of factors. The interests they have in common may be determined as much by their class position or their ethnic identity as by their biological similarity as women. The interests women have in common *as* women are called *gender interests*. Moser (1993) distinguishes the needs of women that ensue from their gender interests into strategic gender needs and practical gender needs. Strategic gender needs are the needs women have as a consequence of their subordinate position in society and relate to women's power and control. Practical gender needs relate to the actual roles and responsibilities women have. They do not challenge women's subordinate position in society. "Practical gender needs are a response to immediate perceived necessity, identified within a specific context" (Moser 1993: 40). The differentiation between practical and strategic gender needs provides a critical planning tool. It can assist policy-makers and development planners in identifying more gender-sensitive solutions.

4.7 Emic and etic

Every person has formed a mental image of the society he or she is a member of. This image is strongly influenced by the prevailing social norms and cultural values. Anthropology tries to understand and analyse the ideas and ideals of a partiular people through their own views, which is called the *emic* approach. This is in contradistinction to one that is based on external (scientific) values and distinctions, which is called *etic*.

The concepts emic and etic were introduced by the linguist and anthropologist Kenneth Pike who derived emic and etic from the terms phon*emic*s and phon*etic*s. While originally the terms phon*emic*s and phon*etic*s were linguistic terms, in anthropology the concepts emic and etic were gradually separated from linguistics. They are often used in medical anthropology, for example. Applying an emic approach requires understanding of the language of the people studied. The terms and expressions used by the people themselves give us clues about their understanding of the world and the meanings they attach to their words. The anthropologist Marvin Harris (1968) defines the concepts as follows:

> "*Emic* statements refer to the logico-empirical system whose phenomenal distinctions or 'things' are built up out of contrasts and discriminations, significant, meaningful, real, accurate, or in some other fashion regarded as appropriate by the *actors themselves* …
>
> *Etic* statements depend upon phenomenal distinctions judged appropriate by the community of *scientific observers*" (Harris 1968: 571, 575, my italics).

Etno-scientists (anthropologists) focus on the development of methods to understand other cultures. They try to describe and explain the attitudes and behaviour of the groups they study. Clifford Geertz called this "the native's point of view" (in Keesing 1981). De Josseling de Jong (1977) speaks of "the participants' view of their culture". In a certain sense, the role of the anthropologist is that of a translator. However, as Feleppa (1986) has observed: "reconciling observer interests and objectivity is a matter of long-standing controversy in social theory and is by no means limited to the etics/emics problem."

Marvin Harris (1979) criticises supporters of the emic approach for being obscurantists: "Obscurantists deny the applicability of scientific research principles to the study of divergent and convergent socio-cultural phenomena […] they […] increase rather than decrease the semblance of disorder in the socio-cultural realm" (Harris 1979: 315). He advocates the etic approach as it would bring one closer to the truth: "There are also etic truths, and […] they alter only in conformity with the agreed-upon data collection and theory-testing procedures of the community of scientific observers" (Harris 1979: 318). The 'clarity' Harris is offering here, is clarity at the cost of the truth. Harris opposes the emic view (cultural validity) to the etic findings (scientific validity), in which he differs from Pike who thought that the etic output could only be realised through emic inputs. However, this is also disputable. In medical anthropology, etic analysis does not depend completely on emic analysis but you cannot do without it, since medical anthropologists strive to understand people's perceptions about disease and health to explain their health seeking behaviour.

In this thesis, the emic concepts on illness and curing of the people in Muthurajawela wetland will be discussed, complemented with etic data on marsh-related diseases. Being aware of the criticism levelled against the emic-etic distinction, I still believe that it is relevant and useful. In anthropology it is important to look at the same thing from different angles, from the

'inner' perspective, in order to get better insight in how the informants reflect on their own world, and from the 'outer' perspective, that of the social scientist. The challenge is, to quote Scrimshaw (1990: 92), "to deal with the real process […] and with the reasons behind it."

4.8 Disease and illness

In this study, the concepts etic and emic will be applied and fitted into the explanatory models discussed below. Related to this are the concepts of disease and illness, and curing and healing. The etic and emic approaches and the explanatory models are shown in a matrix at the end of this chapter. The overlap between the fields of etic and emic shows how they may complement each other. Connections between the concepts, the explanatory models and the environment are also presented in the framework (Table 4.3).

Arthur Kleinman developed an explanatory model to understand health and sickness as a cultural system. He was of the opinion that the models used in medical anthropology were too static. The difference between the concepts disease and illness was first defined by Horatio Fabrega in 1973, and has evolved into a valuable theoretical distinction in medical anthropology. Kleinman thought that the two concepts could bring clarity to the discussion of culture-bound conceptions. In his view:

> *"Disease denotes a malfunction in or mal-adaptation of biological and/or psychological processes. Illness, on the other hand, signifies the experience of disease (or perceived disease) and the societal reaction to disease. Illness is the way the sick person, his family, and his social network perceive, label, explain and respond to disease"* (Kleinman 1978:88).

In other words, disease is the professional definition, in which symptoms are explained in the context of medical science and treated in professional institutions. Illness is based on people's own experiences. Cassell and Helman simplify this by stating that illness stands for what the patient feels when he goes to the doctor, and disease from which he suffers on the way home from the doctor's office. Disease, then, is something an organ has, illness is something a person has (Helman 1986). Helman observes that disease without illness is possible as well as illness without disease. The first is a common phenomenon in modern medicine, with its emphasis on the use of diagnostic technology. Physical abnormalities of the body are found but the patient does not feel 'ill'. Examples are hypertension, raised blood cholesterol, carcinoma's and more recently HIV infection. In the case of illness without disease, the patient feels that something is wrong, but is told after a physical examination that nothing is wrong with him or her. Examples are irritable colon, hyperventilation syndrome, recently also chronic fatigue syndrome, and the wide range of folk illnesses such as 'spirit possession'.

According to Kleinman, explanatory models contain explanations of any or all of five issues: aetiology; onset of symptoms; patho-physiology; course of sickness (severity and type of sick role); and treatment. Explanatory models are tied to specific systems of knowledge and values centred in the different social sectors and sub-sectors of health care system (Kleinman 1978). Elaborating on the treatment aspect, Young (1983) uses the word *curing* to refer to practices which are effective from the point of view of biomedical science and health care professionals, in either limiting, reversing or preventing disease. The word *healing* refers to the practices that are considered effective for the illness of the people concerned.

Disease can be distinguished from illness like curing can be distinguished from healing, but it will be more difficult to maintain a distinction in case of psychological or psychiatric disorders. Certain psychiatric disorders have a biological-genetic cause but are given different symbolic meanings in different cultures. If we take depression as an example, it could be argued that depression is an illness and not a disease. Some forms of depression, however, have universally the same causes. Kleinman has observed that the western form of depression can be found everywhere in the world, but that its manifestations are culture-bound. Richters' (1991) major criticism on Kleinman's views was that he did not consider patients as being part of a larger macro-social context.

Health transition
At the end of the eighties, John Caldwell (1993) and others introduced the term 'health transitions' referring to changes in the cultural, social and behavioural determinants of health, determinants of health other than medical interventions and the material standard of living. Caldwell identified several countries (including Sri Lanka) with health achievements far beyond what one would expect on the basis of their capita income. Sri Lanka's estimated per capita income in the early eighties was U.S. $320 with a life expectancy of 69 years.

- In 1988, Sri Lanka spent 1.7 percent of its GNP, or $7 per head of the population, on health and provided one doctor per 5520 persons in order to achieve a life expectancy of 71 years.
- In the same year, Iraq spent 4.6 percent of its GNP or $123 per head of the population and provided one doctor per 1740 persons to achieve a life expectancy of 64 years.

The strongest factor correlating with health success in Sri Lanka turned out to be the level of education of women of maternal age, immediately followed by the practice of family planning and the education of men. The correlation of health success, the number of doctors, and nutritional levels was less strong, and there was a weak correlation with per capita income (Caldwell 1993).

The health transition concept has been adopted by Kleinman (1978) as an extension of his own model and helps to meet Richter's criticism of not taking into account macro-social processes. Changing macro-social relationships, political as well as economic, lead to new and additional health seeking and health maintaining behaviour. People manage to incorporate macro-social changes in their own explanatory models, they make choices between traditional and allopathic practitioners, using a number of different sources in their social networks, including friends, family, folk healers or medical professionals. Kleinman and Caldwell advocate the use of applied anthropological research to explore the changes and mechanisms that lead to improved health in poor countries. Helman (1986) stresses the importance for medical anthropologists to study the cultural factors that are either causal, contributory or protective in their relation to ill-health.

4.9 The household production of health

The concept of household production of health (HHPH) by Berman et al. (1994), in which internal and external resources of households are related to the health of their members, places households in the centre of the health-maintaining process. Berman identifies three levels of health maintenance in connection with household health behaviour. First, he argues that households exist within a social and economic environment, that the HHPH includes matters like income, education, and social status, which affect the options available to the household.

It includes availability of clean water and a safe environment, physical access to health services and transportation. At the second level Berman classifies a wide range of behaviours which he calls the intra-household health behaviours. They include infant and child feeding practices; child care; health seeking behaviours; hygiene and sanitation behaviour; ante-natal and post-partum care; use of preventive health services and curative services; spending on all forms of treatment, and home improvements in relation to health. Underlying these behaviours are patterns of knowledge, beliefs, cultural norms and expectations of efficacy. Each of these sets of behaviour, he says, is constrained by the household's environment. The health effects or efficacy in health production of these behaviours make up the third level of his framework.

Related to this is the livelihood system (see Table 4.1) in which resources are available or not, in order to maintain or improve a household's state of well-being and health. Berman states that health producing behaviours are not necessarily conducted with explicit links to health in mind. From the emic point of view, there is intended and unintended health behaviour, which can have an impact on health or not. Behaviours are thus different from strategies in that health producing behaviour can be unintended, while health producing strategies are formed with a conscious objective in mind.

4.10 The natural environment

The environment is often an important resource base of the economy of the poor. Over the past decade, approaches known as 'community-based resource management' have been used to mobilise communities around programs aimed at environmental conservation. Guidelines have been formulated to help policy-makers and donor agencies address environmental concerns. The concept of integrated resource management aims at achieving the dual objective of sustainable development and nature conservation. In general, integrated resource management programs are implemented in agreement with the local people who carry out various activities in the area concerned. Both parties are to decide on how the environment should be managed. The inhabitants who make use of wetland resources may be aware of loss or damage to the wetland, but may be powerless to do anything about it.

Traditional users, such as fishermen, may not be able to reduce their fishing activities and put a stop to the over-exploitation of wetland resources. They are depleting fish stocks because they have no alternative job opportunities. Many wetland conservation projects now offer income-generating activities for the people dependent on the wetland. The tension between the demands created by livelihood activities and conservational objectives has been the focal point of discussions. There have also been debates over whether integrated conservation projects are effective. Salafsky and Wollenberg (2000) tested the hypothesis of the Biodiversity Conservation Network (BCN), that if local people are given the opportunity to benefit economically from the biological resources, they will also control it better and take action to counter internal and external threats to these resources. Livelihood interests will then stimulate conservation rather than neglect or damage it. It is beyond the scope of this thesis to discuss the outcome of the tests in detail but the final results of the projects are summarised in BCN (Salafsky et al.1999).

In the HHPH-model, environmental issues are also related to health. Berman states that while a healthy environment can be an asset to the household production of health, an environment like the wetland contains health hazards that are a liability to the households living in it.

4.11 Conceptual matrix

In the literature, the distinction between emic and etic approaches is usually applied in the field of medical anthropology to distinguish illness from disease. In this research, the concepts have been extended to aspects of treatment (healing and curing). The emic-etic distinction can also be applied to views on the characteristics and use of the natural environment. The point of view of the people involved will be different from and of another nature than the scientists' point of view. Researchers of other disciplines are recommended to look at their data from these two different angles. In the matrix below (Table 4.3), the emic-etic distinction is applied to health, livelihood and environment, key issues in this research.

Table 4.3 Matrix on *emic* and *etic,* in relation to health, livelihood and environment

Emic (folk-sector) *Main study area of anthropology.*	Culture-bound interactions and context. *Interdisciplinary translation.*	**Etic** (professional sector) *Main study area of biomedical and natural science*
Illness (Actors' perception) Logic-empirical causes: - Body imbalance - Error - Sin - Fate - Cosmology	 (Medical) Institutional Networks. Social relationships: - Households - Family - Community	*Disease* (Universal claims) Scientific causes: - Germs - Trauma - Psychological
Healing - Folk-medicine - Non-professional - Healer	Choices and decisions. Strategies.	*Curing* - Technical science - Biomedicine - Health care
Livelihood strategies; from the native's point of view Coping Surviving Maximising Personal development	*Environmental problems & livelihood vulnerability* Deforestation Population pressure Natural disasters Health hazards	*Strategies by environmentalists; from nature's point of view* Balancing the ecosystem Conservation of nature Clean air, water, soil Environmental protection

Although an emic and an etic area has been created in the matrix, it has been stated earlier that the distinction is not a clear-cut one. The same holds for the distinction between disease and illness. The matrix serves therefore as a (square) venn-diagram with grid lines between the emic and etic field to show that there is an overlap, an area where interactions take place. In this area, the choices and decisions people make can be based on considerations that can be emic or etic in character, or a combination of these. The interactions can have a long- or short-term duration and may go either way, sometimes balancing more to the left sometimes more to the right.

5 Research Design and Methodology

As was stated in the first chapter, the objective of this study was to contribute to a better understanding of how poor people in a wetland ecosystem maintain their livelihood and their health. The study also paid attention to the role of the support agency, the Integrated Resources Management Program (IRMP) in the wetland and its relationship with the dwellers. Based on the four clusters of research questions as formulated in Chapter 1, nine questions with indicators and methods of data collection were identified, which are presented in the table below.

Table 5.1 Specific research questions and indicators

Research questions	**Indicators**	**Methods**
1a. .What resources and assets do vulnerable households in the wetland environment have and how do they use them?	Number and kind of resources and assets of households, and strategies to use and safeguard them.	Observation, structured livelihood survey.
1b.What is the role of gender in ownership, access, and use of resources and assets?	Strategies undertaken by women to earn a living and the right to make decisions over the items they possess.	Open interviews, livelihood survey, official documents of pawned jewellery.
1c. How important are social resources and assets in relation to material resources and assets?	Social and support networks assisting, and material resources and assets used.	Livelihood survey, observation.
2a. How are the accessibility and use of resources constrained by the characteristics of the environment?	Constraints of the environment and strategies used by households to overcome them.	Survival survey, livelihood survey, open interviews.
2b. Do these constraints differ according to gender?	Constraints for men and constraints for women.	Survival survey, livelihood survey, open interviews.
2c. What strategies do men and women use to overcome the constraints of the environments with regard to livelihood in general and health in particular, and what is the effectiveness of these strategies?	Activities of men and women to earn a living and guard their health. Emic aspects.	Livelihood survey, survival survey, open interviews.
3a. What impact does the environment have on the health condition of men and women in vulnerable households?	Incidence of disease in the wetland area. Etic aspects.	Hospital records, survey of the Medical Research Institute (MRI).
3b. What are the emic and etic factors that can either cause, contribute to, or protect from illness in the specific environment of the wetland?	(Perceived) disease causing elements, protection possibilities and preventive behaviour.	MRI survey, survival survey, vaccination cards, nutrition survey
4. What is the role of the institutional environment (IRMP) in assisting people not to deplete the natural environment?	Income-generating projects and their effects on both the ecosystem and the local people.	Literature study, open interviews, observation.

To obtain the information for answering the above questions, three different methods were used for data collection. A literature study was carried out. Quantitative and qualitative methods were used to collect both emic and etic data. This mix of methods was not only directed to recover the actual behaviour and outcomes, but also to foster a better

understanding of the meaning of the behaviours (Scrimshaw 1990). Details about the methods used are presented in sections 5.1 to 5.3. At a later stage, a survey on livelihood was designed and carried out in addition to the original survival survey, which related mainly to health. Both surveys were carried out at the household level. In early 2000 the study area was extended to the resettlement village Awarakatuwa to the south of the wetland. Results of surveys carried out in the wetland, by Sri Lankan research groups, were also used. To get a clear idea of the data used for this study, the different sources are arranged in the Tables 5.2 en 5.3.

5.1 Literature study

The literature study comprised of studies on livelihood, health, and ecosystems in relation to people. As background to the wetland, planning and design reports on Muthurajawela wetland and surroundings were studied. These provided information concerning land tenure, health and diseases, and population. Specific data in relation to human development in the marsh was derived from IRMP reports.

5.2 Quantitative data collection

Socio-economic surveys conducted by local researchers were screened for useful data. Medical information was obtained from a short report conducted by the Medical Research Institute (MRI) on the health status of the people living in and around Muthurajawela wetland (Table 5.2).

Table 5.2 Surveys carried out by Sri Lankan research teams

Date	Title	Conducted by:	Sample
1991	Socio-economic survey report, Muthurajawela marsh	N.G. Karunaratne	About 150 households
1992	Muthurajawela - public health aspects	Medical Research Institute	Different numbers of samples
1998	Socio-economic baseline survey in Muthurajawela marsh	P.K.S. Mahanama	631 households
1999	Socio-economic survey of Negombo Lagoon	N.K. Dangalle	1200 fishing-families

Additionally, two household surveys were carried out by the present researcher on survival and livelihood strategies respectively (Table 5.3). Later on it became clear that information from the resettlement area would be needed to give a more complete picture of the strategies used in the wetland. Twenty households were therefore selected in the resettlement village Awarakatua, making the number of households involved in each survey one hundred.

Table 5.3 Surveys carried out by the researcher

Date	Title	Research question(s) involved	Household sample			
			Marsh	Lagoon	Resettle-ment village	Total
Nov.1998-June. 1999	Survival survey (health topics)	3	50	30	(20) See below	100
Nov.1999-April 2000	Livelihood survey	1 and 2	50	30	(20) See below	100
April/May 2000	Combined survival and livelihood survey	1, 2 and 3			20	
May 2001	Rapid appraisal on nutrition	3	5	5	5	15

For each household survey carried out by the researcher, two female interpreters were hired. They were graduate students who were fluent in Sinhala and English. The survival survey questionnaire contained about twenty-five (see Appendix 4) mainly pre-coded questions on health and wetland-related diseases, disease prevention, health seeking behaviour, family planning and workload. The respondents in this survey were women. The livelihood survey questionnaire contained over twenty-five (see Appendix 5), mainly pre-coded questions on family structure, income, resources and debts of the household, gender roles and ownership within the household, internal and external support, and responsibilities for children. In this survey any adult member of the household could be interviewed, but in practice most of the respondents turned out to be women, as the men were usually not at home at the time of the visit. The combined survival and livelihood survey focussed on women, but, as in the other surveys, other household members were sometimes consulted on specific questions.

There are no clearly demarcated villages in the marsh. The respondents were squatters who settled at places that were most suitable to them. The percentage of households involved in the surveys on the three islands in the mouth of the Negombo lagoon was lower than in the marsh. On the lagoon islands, there were relatively more rich people, who were not included in the surveys. The procedure was purposive sampling with exclusion of households with certain characteristics. For example, houses with brick walls, tiled roofs, a staircase, and ceramic tiles on the porch, were left out. The inhabitants of the islands have a more homogeneous socio-economic background (being fishing-families), which yields less variable results. In Table 5.4, the settlements in the marsh and the islands in the lagoon are listed with the sample sizes for the survival and the livelihood surveys.

Table.5.4 Sample size of the household surveys, and the areas selected.

Code	Area	Estimated no. households	Sample size survival survey	Sample size livelihood survey
Marsh settlements				
1	Kadolle	80	6	7
2	Uswatte	140	10	10
3	Leenuswella	40	4	3
4	Heenella	30	3	3
5	Ja-Ela bunt	230	17	18
6	Nilsirigama	60	5	4
7	Pubudagama	80	5	5
Lagoon islands				
8	Munakkare	500	12	11
9	Siriwardene	300	10	10
10	Monaco and Wedikande	150	8	9
Resettlement village			*Combined*	
11	Awarakatuwa	240	20	

The sampling procedure was as follows. The settlements were usually entered from the main road. Once in the settlement, every fifth household was visited starting from the second road (randomly selected with a dice). If nobody was home, the next house was visited. If there was a road junction, the direction most left (randomly selected using two objects with different colours) was taken to continue the survey in the same way. Half of the interviews were commenced at the end of the road, or the settlement, to avoid biases in the data as those households were usually more remote. In the resettlement area, there were eight parallel lanes and alternately two or three households per lane were visited and interviewed using the combined questionnaire.

Analysis of the quantitative data

Two different computer database files, one for the survival and one for the livelihood survey were designed, with a code distinction for the marsh and for the lagoon area. Answers were processed into frequency tables and some were combined into cross tables. The results are shown in the chapters on livelihood and health.

Other studies

The IRMP provided a formal letter of introduction to facilitate co-operation by officials. This was especially useful in gathering data from the hospitals on disease prevalence in the area. Three hospitals situated close to the wetland were visited to collect data on six, marsh-related diseases in order to get an impression of the seriousness of these diseases in the area. The three hospitals were: the base hospital at Negombo, Ja-Ela hospital, and the teaching hospital at Ragama. The data collected only relate to the in-patients. No data were gathered on filariasis or less serious disease cases that are usually treated at the out-patient department (OPD). The diseases covered in the research were: Japanese encephalitis, dengue and dengue hemorrhagic fever, leptospirosis, malaria, diarrhoea, and alcohol related liver disease. Appendix 7 presents specific data for each of the three hospitals in the wetland area. The total numbers for the diseases described are presented in Chapter 11.

A rapid appraisal was carried out on nutrition in May 2001, involving 15 families from the three study areas (see Appendix 6). Families with a child under school age (from one to five years) in each area were selected. The frequency of important food items consumed in the family as a whole was measured. After that, a 24 hour dietary recall was done for the parents as well as for the child, resulting in 34 recorded dietary recalls. The results of the nutrition appraisal are presented in Chapter 11.

5.3 Qualitative data collection

Open-ended questionnaires were designed in order to get in-depth information on population pressure and family planning, gender, income and money handling, assistance during floods, childbirth and funerals, and leisure activities. Other questionnaires were designed to answer the research questions on problems related to alcohol and drugs, illegal squatter status, suicide, water and sanitation, and health seeking behaviour.

Life histories of squatters with different backgrounds were recorded to get an overall picture of their livelihood, and to place their livelihood in a time perspective. Case stories and other stories were also recorded. In this thesis, the names of persons in the stories have been changed for reasons of privacy. Village observations were carried out as well as observations during fishing-trips, healing sessions, health education meetings, etc. During the household interviews, observations were made about the house and its surroundings. Open interviews were also held with different type of traditional healers in the area. Informal interviews were held with NGO leaders, UN and embassy staff involved in wetland conservation, project and company managers, lagoon fishers, bar-keepers, etc. Apart from this, maps of the area, included in the thesis, were designed at the GIS section of the Central Environmental Authority (CEA). Photographs were taken of wetland sites, household settings and livelihood generating activities. At times, the IRMP provided assistance for fieldwork, especially in relation to the topics of nutrition and income generating activities.

Checking patient records at Ragama Hospital.

Analysis of the qualitative data
The field-notes were processed and categorised. The categories were: environment; water and sanitation; health and family planning; work and finances. Answers that offered a good illustration of life in the wetland, are presented in the form of case stories in the appropriate sections.

5.4 Time schedule of the research

1. Orientation period, June 1998 - June 1999
   In this period, introductory contacts were established with the project staff of the IRMP and the people in Muthurajawela. The wetland and the surrounding areas were explored. Possible supervisors for the research were contacted. Relevant literature was gathered from libraries, shops, institutes, national and international organisations and via the internet, and a conceptual framework was worked out. A female translator was found and open interviews were conducted in the wetland on topics such as work, health, water and sanitation, and family planning. Hospitals were visited to obtain medical data. Research questions were translated and fitted into structured as well as open-ended questionnaires, and pre-tested in the field. The household survival survey was completed.

2. Phase I, July 1999 - August 2000
   Theoretical concepts, study design and methods were worked-out in more detail. New questionnaires were constructed and pre-tested in the field, and the livelihood household survey was carried out. Data were processed, analysed and the findings of the marsh area were compared with that of the lagoon area in order to identify significant differences in livelihood sustainability. The first chapters of this thesis were drafted.

3. Phase II, September 2000 - June 2001
   In this phase, more life histories were collected and participant observation was carried out for certain livelihood activities. Visits to hospitals were completed and a rapid nutrition survey carried out. General observation and visual documentation was carried out throughout the research while visiting the villages.

4. Finalisation and finishing touch, July 2001 – April 2003
   The thesis was completed in the Netherlands.

6 The Research Area: History, Characteristics, and Conservation

To understand the setting the inhabitants of the wetland have to survive in and the developments that have taken place in the past with respect to the marsh, this chapter first describes a few general characteristics of the study area. The physical characteristics of the wetland and the environmental problems are discussed after an explanation of the history of Muthurajawela. Next, the values of the wetland are described and an overview is presented of the planning and implementation process of the conservation project in order to understand the strategies of the environmentalists as shown in the matrix (Table 4.3). Most of the information in this chapter is based on data from various documents of the 'wetland conservation project' (later called the IRMP), prepared in the period 1991-1999. The human development component of the IRMP is discussed in Chapter 13.

6.1 General characteristics

Muthurajawela coastal wetland is situated between the capital Colombo and Negombo-city (Figure 1.1). It covers over 6000 hectares half of which is marshland, the other part being a lagoon. In the narrow opening that connects the lagoon with the Indian Ocean, there are a few inhabited islands. This part is also known as the Negombo channel segment. Traditionally, Negombo has been one of the main suppliers of fish for Colombo, being the centre of commercial fish distribution and consumption. Next to the income from fisheries and the employment provided by the free trade zone, the service sector, including the tourism industry in Negombo, has developed strongly as a source of income and employment. Many squatter families live in the marsh area (3000 hectares) that extends southward from the lagoon. The population of Gampaha district, in which the wetland is situated, is the district with the second highest population density after Colombo (Arjuna 1997), with an average of 1000 persons per square kilometre. Urban centres with growing populations are situated along the borders of the wetland. The population density in those places varies between 2500 and 8000 persons per square kilometre (Samarakoon 1993). A few large roads and many smaller sand roads run through the area. An important road running just outside the wetland connects Colombo with Negombo and the main harbour. The international airport and a free trade zone are nearby.

6.2 History of Muthurajawela

The name Muthurajawela is explained in various ways. Literally translated from Sinhala, it is a conjunction of Muthu=pearl; Raja=king; Wela=marsh/land. Some say that it was named after a rice variety, known as *mutu samba*, a pearl-shaped rice variety, which was once produced in this area. Others say that it is called after a king whose name was Mutu Raja.

The Portuguese and the sampans of the Moors
In the 15th century the marsh seems to have been fertile wet-rice (*paddy)* land. It was a flood plain of two major river systems, the Kelani and Dandugum River. When Negombo gained importance as a seaport, the king of Kotte began constructing a canal from the Negombo Lagoon to the Kelani river to gain easier access to the port. Salt water intrusion into Muthurajawela began. In order to subdue the people, the Portuguese (first arriving in 1505) seized Muthurajawela, which was the granary of the kingdom of Kotte.

Negombo Lagoon served also as a seaport for the Moors, descendants of Arab or Indian Muslim traders, who were the rivals of the Portuguese in sea trade. The Moors with their wooden boats (*sampans)* were conducting frequent forays against the Portuguese ships

carrying food and troops between Colombo and Negombo. This made it necessary for the Portuguese to find an alternative route to the sea between the two towns. An alternative route became even more important when the land route was attacked by troops from the king of Kotte. The Portuguese completed the canal, which had been partly constructed by the king (Abeyasekera 1998). The canal is now mistakenly referred to as the 'Old Dutch Canal'. The Portuguese, however, never showed any further interest in Muthurajawela.

The Dutch, their ditches and dams
At the time the Dutch arrived in Ceylon, the kingdom of Kotte had been conquered by the Portuguese. The Dutch were much more interested in trade and profits than the Portuguese, who had spent a lot of time spreading their religion and expanding their power (Niven et al. 1996). The king of Kotte who had been converted to Catholicism had granted the entire kingdom to the king of Portugal. However, the Dutch took over Kotte and feeding its inhabitants became their responsibility. At that time, the Dutch were already known for their ability to reclaim land from water. The effort to rehabilitate Muthurajawela for the production of the country's staple food seemed to be a viable plan. The feat of reclamation was fully realised by De Costa, who wrote the first known colonial reports on Muthurajawela.

De Costa's plan consisted of three steps:
- The exclusion of saline water from the marsh;
- Obtaining fresh water during the dry season;
- The establishment of ownership of the drained marshes.

The first step was achieved by a system of dams and sluices placed at the north and south ends of the tract, the second by enclosing certain water areas and digging a channel to Muthurajawela. The third step was implemented by administrative action, but with difficulties. The main problems were the lack of money and labour. The Dutch used forced labour in the construction works.

In 'Ceylon and the Hollanders 1658 – 1796', written by Sir P.E. Peiris, a reference is made to the work on the Muthurajawela project during the time of Governor Von Falck:

> *"At Colombo de Costa took up the improvement of Mutu Rajawela, estimated to contain 6,000 acres which was expected to ensure a sufficiency of rice for Colombo. Previous attempts to improve the existing Sinhalese canal, resulted in the inundation of the land by salt water and to deal with this problem […] he built a series of dams, sluices and channels, and was so far successful that in 1767 he announced the completion of the task. The Governor ordered the area to be divided into allotments[...] but in a few years the arrangements proved a failure, and the land was again abandoned"* (in Abeyasekera 1998: 18).

The Dutch were not able to overcome the problem of the floods. They had not experienced this type of difficulty in their own country where the differences between the tides are less pronounced. The floods from the Kelani and Dandugam rivers were unpredictable. In some years there were minor floods of short duration and in other years severe inundations. De Costa had spent so much money in bringing this swamp under cultivation that some historians have suggested that it may even have played an important role in the downfall of the Dutch Government in Ceylon (Abeyasekere 1998).

The British and Mr. Hamilton in Mootorajaville

In 1796, the Dutch were pushed out of the country by the British. England managed to become the first European nation to rule the whole island of Ceylon. A new attempt was made to make Muthurajawela suitable for wet-rice cultivation, not only for self-sufficiency of food in the colony but also profitable enough to fill the treasury back home. In 1802, a British national, Gavin Hamilton, who worked as an agent of revenue and commerce, submitted a report recommending the advantages to be gained by the rice cultivation scheme. The causes of the failure of the Dutch were analysed, and Hamilton looked for possible ways to overcome them. He suggested the construction of another canal on the west side of the tract, and for the purpose of draining the excess water due to floods he suggested the construction of sluices at some places and the cutting of transverse channels from the main canal to the sea.

The Hamilton canal and the other interventions did not serve their purpose and caused even more salinity and greater flood problems. Also the British suffered from lack of labour and proposed to obtain labourers from India or, if this was not possible, to obtain labourers from Penang. Much later this became reality when they brought in contract workers from south India for the coffee plantations, and later for the tea plantations. In 1847, a European company bought a part of Muthurajawela from the Government for the exploitation of peat which was available in large quantities. However, this project was also a failure and the areas were sold to a few rich native families of Colombo.

At the beginning of the 20th century, the ownership of land in Muthurajawela had been regularised by the British through various acts relating to ownership of land. A few native feudal families became the owners of extensive tracts from Muthurajawela and, with difficulties, started paddy cultivation without the help of the government. Their efforts were partially successful. In 1925, the government, who still owned the greater portion of the marshland, prepared a report for 'The Kelani North Bank Flood Scheme' for the protection from floods in Muthurajawela catchments. Up until 1935, the irrigation department continued to implement the scheme until financial difficulties and the opposition of landowners brought an end to the project (Abeyasekere 1998).

Local cultivators obtained small portions of land on leasehold property (*ande*) from the big landlords. They tried a kind of *devaraddiri*, a four-month old variety of paddy, which became not only fairly salt resistant but also flood resistant to some extent. The cultivators were, however, fighting a losing battle against recurrent floods, influx of salt water and the very insecure terms of tenure of their holdings.

In the meantime, the outbreak of the Second World War caused a disruption in the food supply for the people of the island. Rice supplies from Burma had been blocked. The government tried to promote substitutes for rice while working on improvements for paddy cultivation. A group of skilled cultivators formed a cooperative for the production of rice in Muthurajawela, and in 1942 took over about 200 acres of land from the government. Assistance was restricted to the supply of free paddy seed and the construction of a *kamatha* or dam serving as a means of access. With this help given by the 'Emergency Vote', people were able to cultivate the area for a period of several seasons.

Trials and errors of the national government

After independence in 1948, the government was planning for systematic reclamation of Muthurajawela under a government sponsored scheme. The first objective was to regulate ownership of land for the *ande* cultivators. The cultivators were satisfied with the scheme.

Their greatest concern was to own the land that had required so much time and energy to cultivate. They accepted the seasonal floods and were prepared to take the risk, provided they were helped with free seed in times of crop failure due to floods. An attempt was made with the introduction of a new paddy variety from India called *pokkali*, which was claimed to be salt resistant (Abeyasekere 1998).

The next step was the selection of areas suitable for reclamation by using low cost methods, such as channelling and pumping. In between the Hamilton and the Dutch canals, 28 cross canals were constructed with sluices to prevent salty water inflow. However, even with the new interventions, the situation remained unsatisfactory. When large paddy fields in other areas became more important, the irrigation department did not pay much attention to the relatively small and troublesome swamp, and the area was abandoned again (Schipper 1992).

The government could not accept failure and admit that it performed no better than the Dutch and British governments. With the recent independence, feelings of national pride and patriotism rose high. The people thought of the times in history when their country was referred to as 'the granary of the East'. But with the almost total failure of the 1953 crops, the adoption of an entirely new approach for the reclamation of Muthurajawela was proposed.

A complicating factor was that the continuing growth of Colombo put pressure on its surroundings. Plans were therefore made to reclaim the area for housing. In 1966, the irrigation department did a feasibility study but the lack of finances made implementation impossible. In 1976, a team from the Netherlands did a study for a large scale development project in the field of housing, industry and agriculture, but this also turned out to be too expensive. In 1985, Chinese experts studied the possibilities, but nothing was done with their findings (Van de Weijer and Rentema 1992).

Three years later, Dutch students made plans for housing improvements for the communities in Muthurajawela and for horticultural activities. The project was carried out on behalf of an NGO that wanted to improve the situation of the illegal settlers in the marsh. At the same time there were studies carried out to see whether reclamation was a possibility. Plans for reclamation brought about a reaction by the environmental lobby, whereupon president Premadasa decided to have a master plan prepared for Muthurajawela, for which he appointed the Greater Colombo Economic Commission (now BOI).

6.3 Physical characteristics and environmental profile of Muthurajawela

Climate
Muthurajawela is situated in the wet zone of Sri Lanka. Two monsoons with heavy rain occur in April/May and in October/November, but there are also inter-monsoon periods of rain. The annual rainfall is 2 to 2.5 meter per year. Temperature ranges from an average of 31° Celsius in April to 22° Celsius in January. Humidity is about 80% throughout the year (CEA 1996).

Hydrology
Muthurajawela is a slightly sloping area of which some parts lie below sea level. During the wet periods, large parts of the marsh are flooded and the salt content of the marsh water is low. There are several small rivers in the area. The main river is the Dandugam Oya. During the dry season, fresh-water inflow is less, and saline water flows into the marsh from the lagoon.

Soils
The topsoil of the marsh consists of three different peat types[10]. Reed and sedge type peat on top, shrub and tree type peat in the middle and humus type peat in the bottom. The depth of the peat layer varies from two to three meters in the centre of the wetland to much deeper along the edges.

Marsh vegetation
Despite centuries of human interference, the marsh is still an important habitat for many species of plants and animals. In the marsh area, vegetation consists of grasses, scrubs, reed, rushes, small trees, like the *kaduru,* and coconut trees along the shores. Shallow pools and canals with stagnant water are rich in nutrients and covered with duckweed and water lilies. The marsh plant community is unstable and represents one of the final stages toward dry-land formation (CEA 1994).

Lagoon vegetation
The lagoon vegetation consists of mangroves at the fringes, reeds, sea-grasses and algae. Mangroves provide an important nursery function for fish and shrimp. Where mangrove have already been depleted, sea-grasses compensate for the loss of the mangrove nursery function.

Fauna in Muthurajawela
The fauna in the conservation zone is diverse. It is grouped here into three categories:

- animals of commercial importance: fish and other organisms (tortoises, crocodile, birds such as teal); the fish organisms of particular importance are the fin-fish and the crustaceans (shrimps and crabs). Shrimp and fish for consumption are the main targets for fishing.
- animals of conservation (and eco-tourist) importance: insects (butterflies), amphibians, reptiles and birds;
- animals that are disease vectors or hosts (mainly mosquitoes, rats, pigs and goats).

6.4 Threats to the ecosystem

Sedimentation
Natural sedimentation in Muthurajawela wetland is slow but the interference of people accelerate this process. Upstream land clearing, inland drainage, and tidal flows have an influence on the sedimentation in the Negombo lagoon and its outlet. Sand, carried into the lagoon by tidal flows, is deposited in the basin and the channel of the lagoon. The trend of continuous settlement expansion in the channel segment, in which new land is 'created' by silt trapping and subsequent filling, will gradually close the channels and reduce the tidal exchange. The result of this will be a deterioration of the mangroves that are dependent on the influx and outflow of seawater and will also hamper fishing boats in reaching parts of the lagoon.

There are three sources of pollution identified by the Metropolitan Environmental Improvement Program (MEIP): 1) Solid waste dumping in the marsh and the lagoon, 2) Industrial waste discharge, 3) Domestic and municipal waste. Fish waste (mainly shark heads), old motor-oil from trawlers and small boats, and polythene bags are polluting the

[10] Peat is a soil type in which organic matter is produced faster than it is decomposed, resulting in the accumulation of partially decomposed vegetative material. It can be used as building material.

wetland. Other pollutants come from the garment industries (in the free trade zone) which discharge effluents containing dyes and other chemicals in the rivers (Graeber and Ros 1996).

Industrial waste dump.

Eutrofication
Eutrofication is an excess of nutrients in the water, caused by pollution. The filamentous green algae, which grows rapidly by this process, form thick mats that cover the sea-grasses after each rainy season in parts of the Negombo Lagoon. The shaded sea-grasses die off from the lack of sunlight (CEA 1994). The algae begin to die within a period of 1-2 months. The sea-grasses then recover only partly, so it is likely that the sea-grasses may not be able to serve as nursery function for a while, which could result in a loss of fish production.

Destruction
Over-fishing affects the size of the fish population. This over-exploitation is mainly caused by the introduction of modern fishing methods but also by using smaller mesh sizes that leads to the removal of young age classes of the fish and shrimp population. Fishermen continue their fishing efforts because of a lack of alternative income opportunities. Push nets in particular can damage the sea-grass beds, which are an important habitat for fish and shrimp. Mangroves are not abundant in the lagoon and some local people use it for firewood. Mangroves are a unique habitat for plant communities and they provide nursing and feeding ground for certain fish and shrimp species.

6.5 The value of Muthurajawela

In this section, the significance of the wetland and the wide range of its uses, as defined by the conservation project implementers, will be discussed. Some of the uses are dependent on the structure and functioning of the ecosystem, while others are not. Parties and NGO's involved in the wetland are presented in Appendix 2 and 3.

Valuation
From a conservation point of view, the preservation values (non-use values) of Muthurajawela are high because of its biological diversity, scenic beauty, history and scientific potential, in particular when considering its location in the vicinity of highly urbanised and industrialised areas. Its functions and uses are also of regional importance. Functions (indirect values) of the wetland are: flood buffer, biological purifier, and a habitat for fish and wildlife. Uses (direct use values) are: plant, animal and mineral production, recreation as well as research and

education. Locally, the site is used for disposal of waste and land development. From an economic point of view, the area is a highly valuable wetland, with an annual economic value worth, one billion rupees (US$ 20 million) because of the multiple uses it supports (CEA 1994).

Uses and services dependent on the ecosystem

Settlements
Some of the communities living in the northern part of the marsh fish in the lagoon for their primary income. Members of these communities gain access to the lagoon through the Ja-Ela River and the Dutch and Hamilton canals.

Flood buffer
The marsh provides a flood buffering function by receiving and discharging surface runoff to the Negombo Lagoon and to the sea.

Research and education
There are different opportunities for field research in the wetland. It has become a site for research on ecological and sociological topics for students.

Bio-diversity and recreation
The marsh is a popular site among biologists. Fauna, the migratory birds in particular, depends on the food organisms in the mud flats. The fishery stocks are supported by small fish that live in the sea grasses. Tourist hotels are available on the western and on the eastern shores. The recreational value of the lagoon depends on effectiveness of flushing and tidal circulation preventing eutrofication, fish kills, and bad smell.

Estuarine and coastal fisheries
The estuarine fisheries support the income of more than 3000 families who live around the lagoon. The shrimp stocks harvested by traditional trawl fishing depend on the lagoon as a refuge and nursery area, and the small fishery stocks (herrings and sardines) depend on the lagoon for food.

Dilution of industrial effluents and domestic waste
Negombo Lagoon is the sink for untreated industrial effluents from industries at the Ekala Industrial Estate, the State Distilleries Company, partially treated effluents from the free trade zone, and small-scale industries. The lagoon also serves as a sink for municipal and domestic waste. About 90 metric tons of faeces is discharged directly or indirectly into the lagoon annually (CEA 1994).

Uses and services, non- dependant upon the ecosystem

Housing
Since the early 1970s, encroachment into the marsh has increased because of poverty and the inability to purchase land at locations that were more suitable for house construction. The marsh dwellers have no security of land tenure and are not able to invest in housing. Despite the health hazards and the logistical problems encountered during floods, the communities have continued to exist in the wetland. The majority of the houses in the marsh are temporary structures raised on beds of peat soil excavated from the marsh. There is an acute shortage of land for settlement development in the Negombo municipality. As a result, landless people

have been building unauthorised houses on the sand shoals in the channel segment of Negombo Lagoon.

Water and sanitation
The households in the marsh area generally obtain their drinking water and cooking water from the nearest roadside standpipe or from wells. Collection and transporting of water on average requires about 30 minutes (CEA 1994). Washing of cooking utensils, bathing and washing clothes is often done in the nearest canal. Some distance away from the house, pit latrines with raised squatting platforms are used. During a period of rain, the pits of the latrines overflow and their contents spread to the waterways.

Solid waste disposal
Waste and dumping of materials occur in the vicinity of the houses, which causes stagnant water. Consequently, the marshes in the vicinity of settlements become breeding places for mosquitoes.

Clandestine liquor distilling
Illicit liquor distillation takes place in the marsh mainly because of its isolated location and difficult access. A secondary advantage is the availability of water for the cooling of the distilling equipment.

Infrastructure for marine fishing crafts
The channel segment of Negombo lagoon serves as a mooring place for many fibre-glass boats with in-and outboard motors. Several boatyards are found in the lagoon for easy launching of the fishing crafts. As mentioned earlier, fish and oil waste from the fishing boats cause serious environmental problems in the wetland.

6.6 Conservation management

In 1965, the government decided to put an end to investments for irrigation and paddy cultivation at Muthurajawela. In 1984, a plan was formulated in which the total area would be filled with sea sand. The Sri Lanka Land Reclamation and Development Corporation was established specifically for this purpose. There were objections from environmental groups because many of the so-called 'low-value areas' were disappearing and the groups were afraid that Muthurajawela would go the same way as other wetlands.

Master plan
In 1989, a cabinet decision was made to prepare a 'Master Plan for Integrated Development of the Muthurajawela Marsh and Negombo Lagoon.' Being located in the vicinity of the capital city and under pressure of a land-shortage, Muthurajawela was the first wetland in Sri Lanka to receive special attention. To prepare the plan, an environmental profile was needed which required three different sets of information:

- *An ecological study*, including 32 detailed surveys in order to establish the status and significance of the natural and physical resources.

- *A socio-economic survey*, to determine the present conditions and future requirements of the population in and around the area.

- *A survey on development potentials*, including their likely impacts on the environment and the people living in the area.

The first two surveys were meant to reveal the constraints, and the third survey the opportunities for development.

The time-schedule for the preparation of the environmental profile was tight and much effort was put into setting deadlines for the surveys. Therefore, local people and an NGO participated in several workshops. It was decided to concentrate on the marsh part of the wetland, because the target group there was to some extent organised by the NGO, Muthurajawela United Peoples Organisation (MUPO). Most of the fishing communities that use the Negombo lagoon as a source of income were not formally consulted during the preparation phase of the master plan (Oltman and Schut 1998). The master plan, which was formulated with the help of the consulting firm, Euroconsult, was approved in 1991 unofficially, and three years later officially.

Land use-plan
To preserve the ecological values, a detailed land-use plan had to be prepared for the wetland that would indicate areas to allow for different levels of economic activity according to their sensitivity. Differences of opinion existed among environmentalists, local residents, government agencies and investors on what was possible and acceptable. Plans were made to build hotels and golf courses, while local settlers, supported by NGOs and the Roman Catholic Church, wanted land for housing. Others wished to leave the area as it is or to re-establish its agricultural use. The plans became a source of conflicts for conservation policy-makers, residents, local politicians and investors supported by other government agencies. Intensive discussions led to a compromise in which four main zones were identified: a conservation zone, a mixed urban zone, a buffer zone for recreation (see Figure 7.1), and a fisheries zone. With international aid, a country-wide Wetland Conservation Project (WCP) was set up under the Central Environmental Authority (CEA).

Conservation zone
The conservation management plan for the Muthurajawela Marsh and Negombo Lagoon was written in co-operation with specialists from universities and consultants. It was based on the findings of the environmental profile derived from the three surveys. Conservation was defined as "protection and preservation where necessary, and wise (sustainable) use of physical, biological and cultural resources, including public education and research" (Samarakoon and Van Zon 1991). The general objective for the conservation zone is "to maintain ecosystem structures and functions while supporting harmonious multiple use" (CEA 1994). A visitor centre was established in the marsh area to provide information and excursions for national and international tourists, nature education to children, and a place for studies and community activities.

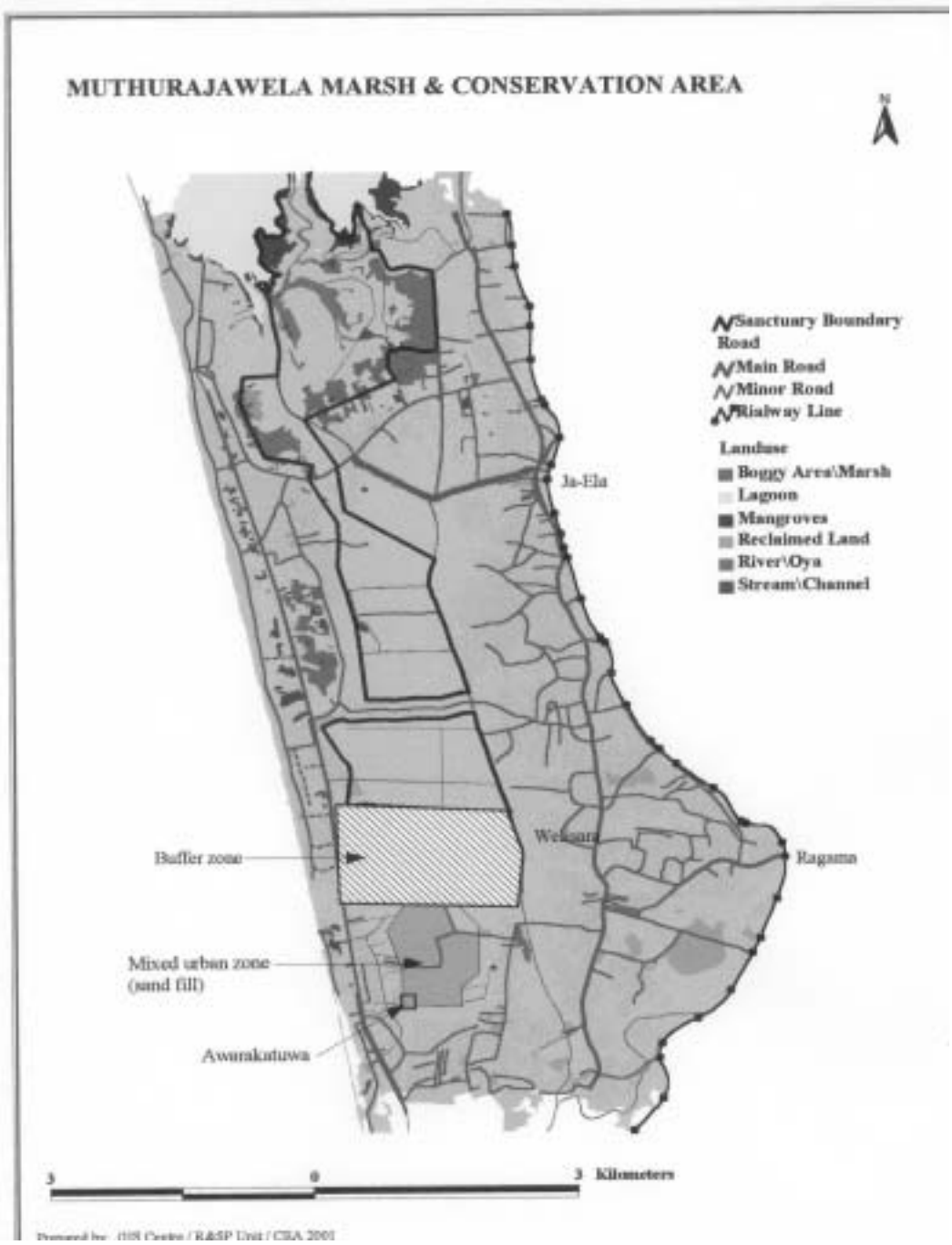
The demarcation of the conservation zone boundary would facilitate proper conservation management and at the same time discourage encroaching. Simultaneously, adequate land would be supplied outside the conservation zone to satisfy the housing needs of the landless communities in the area. The boundaries of the conservation zone were still under revision in the year 2001.

Mixed urban zone
The mixed urban zone was filled with sea sand in 1995. The land was levelled, a drainage system was put in place, and an approach road was constructed. Resettlement of about 220 families from the marsh area took place in the southern part of the sand filled area. In 1996, a Shell gas terminal was constructed in the mixed urban zone and later a tea-warehouse was built. The Ceylon Petroleum Corporation (CPC) has plans to construct a fuel storage facility on the sand-fill.

The buffer zone
The buffer zone between the urban development and the nature conservation zone can only be effective if the activities in the buffer zone itself are economically strong enough to resist the pressure of expanding urbanisation. In Muthurajawela, this pressure is very strong given the severe shortage of land for development in the densely populated Western Province. To integrate the recreational use of the buffer zone with the need for economic sustainability, a preliminary land-use plan was carried out. Under consideration were an 18-hole golf course, a zoo, a marsh garden, a medicinal plant nursery and an open-air sports complex with playing fields. Implementation of the various activities would generate new employment for some 700 to 900 workers, but in the year 2001 none of the plans had been implemented.

The fisheries zone
Fishing organisations in the Negombo Lagoon consist mainly of poor individuals who limit their activities to fishing, to the collective purchase of fishing equipment, and to the organisation of marketing channels. One of the goals in the Conservation Management Plan (CEA 1994) was to give the lagoon fishermen a management responsibility. To realise this the fisherman had to recognise the importance of the Negombo Lagoon as an ecological system. This was done through several awareness programs. Community workshops were also held to supply information on sustainable fishing methods and to strengthen the relations between the fishermen organisations and the department of fisheries. Fishermen are now adequately represented at the decision-making level, and the parties agreed on the ban of certain destructive gear and on penalties for breaking the rules.

Figure 7.1


MUTHURAJAWELA MARSH & CONSERVATION AREA
N
Sanctuary Boundary
Road
Main Road
Minor Road
Rialway Line
Landuse
Boggy Area\Marsh
Lagoon
Mangroves
Reclaimed Land
River\Oya
Stream\Channel
Ja-Ela
Buffer zone
Ragama
Mixed urban zone
(sand fill)
Awarakatuwa
3
0
3 Kilometers

7 People from the Marsh

This chapter discusses the marsh area and the people that live there, including the resettlers in the village Awarakatuwa. The marsh area is located in the southern part of the wetland, where population pressure and health hazards appear to be much less compared to the lagoon area. The chapter describes some of the environmental resources of the marsh and resources of the marsh households. Data are presented on housing, demography and education. Data derived from a socio-economic survey carried out by the team of Mahanama among 550 households in 1998, are also presented here.

7.1 The habitat of the marsh dwellers

In the map (Figure 7.1), the marsh area is indicated with the demarcation line between the conservation zone and the rest of the wetland (sanctuary boundaries). Although the boundaries of the conservation zone are still under revision, Muthurajawela marsh was declared a sanctuary in October 1995.

The mixed urban development zone can be divided in two parts; Kerawalapitiya, a 160 hectare area for industrial development, which was filled with marine sand, and Awarakatuwa, a partly sand filled area for relocation of marsh dwellers. One of the problems caused by the sand-filled industrial area was that the absorbing capacity for water decreased, pushing the groundwater into the neighbouring settlements.

The plans for the buffer zone raised a lot of opposition among environmentalists and the local people. Some of the arguments against the construction of a golf course were the pollution from fertilisers, herbicides and insecticides, the high demand for fresh water to irrigate the course, and the limited benefits for the community. A proposal for a botanical garden was elaborated with the suggestion for the creation of a marsh garden near the visitors' centre. The development of a wildlife park was objected to by the marsh dwellers, as they thought of a safari park with dangerous animals. The recommendations made by the local people for the buffer zone were to leave the marsh as it is, to use it for residential purposes, or to use the zone for coconut and dairy production.

Driving along the Hamilton Canal and the Jayasuria road, several catholic churches and statues of catholic saints can be seen and many nice and well-constructed middle class houses. Behind this, out of sight, are the Muthurajawela marshes. This territory is the grey area of illegal or semi-illegal encroachers who live in temporary shelters, constructed on scarcely filled plots that are subject to flooding.

Kajugasgodelle is a village on a dike, and can be reached by a small dirt road on top of the dike. The houses here vary in quality. There are very simple cadjan (palm-leaves) constructions among the better houses made of bricks. In front of the poorer households, women and girls are making artificial flowers and children are playing cricket after school-hours with an old tennis ball. Although goats, pigs, and chickens are scavenging between the houses, the air is clean and there is little or no noise. During the rainy season people can be seen swimming in the river but during floods some of the households have to do the cooking on top of the dike.

The road through Pubudagama is becoming worse every time. Heavy trucks have damaged this small tar road. At the beginning of the road there is a dumping place for garbage and a

bit further a heap of pieces of small material disposed of by a garment factory. Every 500 meters a water tank can be seen with, at some hours, a long line of plastic water containers in front of it. A water-bowser fills the tanks about once a day. After a heavy rain shower, not only the potholes in the road are inundated with water but also the poorly constructed dwellings along the road. They have no solid foundations, and water sometimes reaches as high as half a meter inside the house. At many spots, the floodwater has stains of oil floating on it.

Public water tank.

Deeper in the marsh is the settlement Kadolle. A long, winding road of red earth leads to the lagoon and the houses along this path have a lot of space between them. On the bamboo or wired fences clothes are usually hanging to dry and bright blue kingfishers are overlooking the area from the electric wires of the village. Many trees, most of them coconut palms, embellish the place. The closer you come to the lagoon, the muddier the road gets and the poorer the households. Cyclists with water containers or with school children on the backseats are common in this village. The distance to the water tap and the school is relatively great.

Dogs are everywhere, also in Heenela, a village along the Ya-Ela River. Halfway on the riverbank is a simple shed with a bar constructed of palm leaves. Men come here by boat or bike to drink kasipu *(illegally brewed alcohol*) *in the morning as well as in the evening. Further down the river is a nice bathing spot where adults with their children are cleaning themselves, looking white from the foam of soap and shampoo. At a grassy spot, elderly women can be seen weaving and soaking* cadjan *mats, which they will sell in the market. Sometimes monitor lizards or snakes can be seen. It is a very green village and many people keep plants in pots, which they will put away at a higher place in times of floods.*

Housing

The number of houses in the marsh increased to 630 units in 1998 (see Table 7.1). The area occupied by most of the houses in the conservation zone is, on average, less than six square meters. Mahanama's survey (1998) revealed that most of the roofs of the houses in Muthurajawela were made of *cadjan* (47%). About 35 percent of the shelters had corrugated iron roofs and the remaining 18 percent consisted of asbestos and tiled roofs. The majority of the marsh dwellings had walls made of timber planks (61%). Twenty-five percent had a brick wall and 13 percent had walls made from *cadjan*. Very few dwellings had tin sheet walls. The floor was made of cement in 78 percent of the houses, the remaining households just lived on clay or sand floors.

7.2 The marsh dwellers

The people in the marsh are settlers from different backgrounds. They are predominantly Sinhalese (96%), all of them adhering to Roman Catholicism, except for two percent who are Sinhalese Buddhist. Tamils, Burghers and Moors comprise the remaining four percent (Karunaratne 1991). The majority of the Catholic people in Sri Lanka live along the western coastal belt as a result of the Portuguese colonial period. The adherence to the Roman Catholic Church is quite strong and has an influence on the exploitation of the natural resources in the area. The people believe that nature is created and controlled by God. Fluctuations in availability and abundance of natural resources is believed to be beyond the control of the resource users. The natural resources are for use of the inhabitants in the area. Therefore, it is difficult for environmental institutes to deny the marsh dwellers access to what they see as a resource given by God.

The people in the conservation zone live dispersed over twelve squatter villages. In 1960 there were only 62 houses in the conservation zone. In 1998, this number was ten times higher (Table 7.1). The main reason for this rapid increase was an influx of people from various locations around Muthurajawela during the previous 40 years (Mahanama 1998). The difference in household size between 1960 and 1998 can be explained by the fact that most households have families of two generations.

Table 7.1 Housing and population increase in Muthurajawela conservation zone from 1960 to 1998

Year	No. of houses	No. of people	Persons per house
1960	62	106	1.7
1970	129	247	1.9
1980	228	685	3
1990	436	1488	2.4
1998	631	2454	3.9

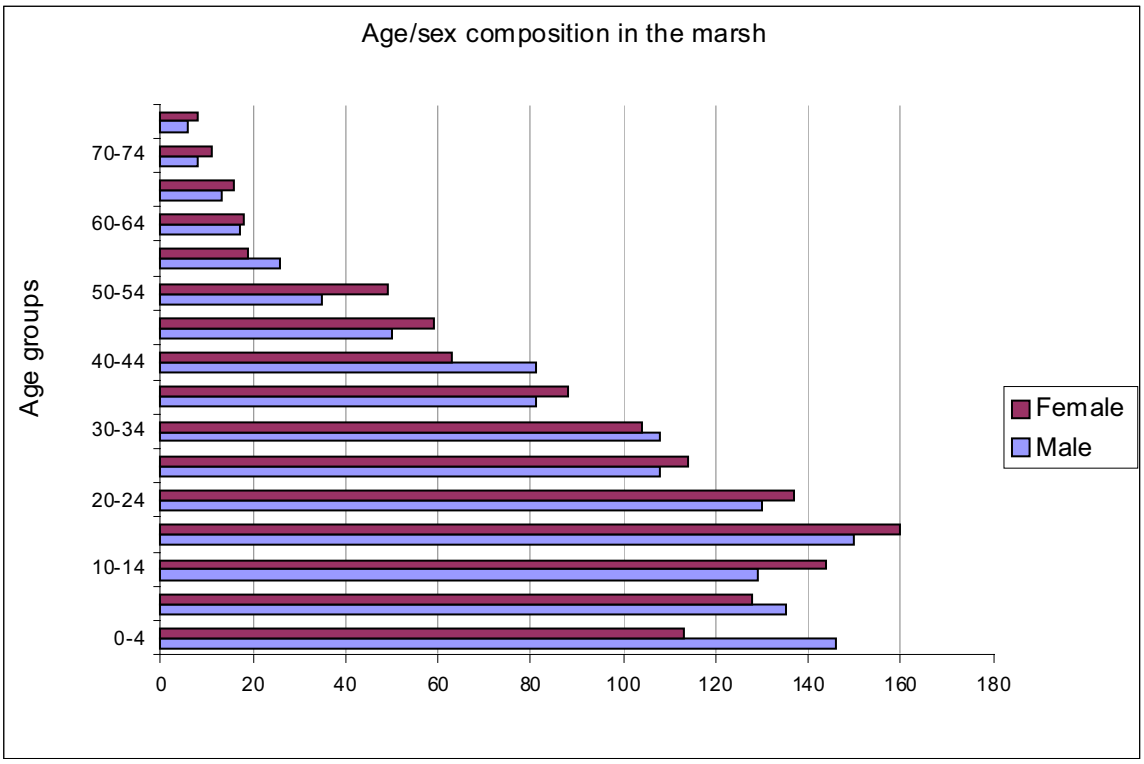
Source: Socio-economic baseline survey in Muthurajawela, 1998.

About 80 percent of the families that have migrated to the marsh originate from different locations in the Gampaha District. These places are relatively close to Muthurajawela. The remaining 20 percent came from other districts in Sri Lanka. The main reason for settling in the marsh was the non-affordability of land in the area of origin (75%). Other reasons given were: the land was received from parents, sometimes as a dowry; the land was provided by the government; or employment opportunities, like fishing, had pulled people to the area. The free availability of state land and the absence of sanctions to prevent encroachment in the wetland facilitated the move. Although Muthurajawela wetland is gazetted in official documents of the Department of Wildlife Conservation as a sanctuary, encroachment in the marsh is continuing. Gampaha district can be identified as one of the major immigration districts in the country. The immigration trend in Gampaha has continued simultaneously with changes occurring in the economic development in the area.

According to Mahanama (1998), migration into Muthurajawela occurred with the intention to form strong extended families that would benefit all members. The marriage system in the wetlands' lagoon area was the *binna* system (matrilocal) in which the couple lived with the wife's family and inherited land from them. Amongst the Sinhalese in Sri Lanka, the preferred form of marriage was what is referred to as *diga* marriage (patrilocal) (Yalman 1971), in which a couple lived with the husband's family and worked their land.

Demography
Mahanama (1998) found that in the conservation area, almost 11 percent was under the age of five, and one-fifth was of compulsory school going age (5-14 years). The economically active group (15-54 years) consisted of two-thirds of the total marsh population and people of age 55 and above was almost six percent.

Figure 7.2



Source: Socio-economic baseline survey in Muthurajawela, 1998.

The figures are representative for the rest of Sri Lanka, apart from the population above the age of 55 which is higher for Sri Lanka as a whole (Arjuna 1997). Almost 30 percent of the women in the marsh are of child-bearing age. The majority of women in the settlements get married before the age of 24. Figure 7.2 presents the overall composition of the population according to age and sex in Muthurajawela marsh. There is no explanation for the different sex ratios between the age groups. However, accuracy of the data could not be ascertained. The low sex ratio in the age-group 45-54 might be due to male mortality due to alcoholism.

Education
All the schools in the marsh-area are governmental schools and education is therefore free. School dropout occurs mainly after completing primary school. About 54 percent of the adults completed secondary education. Almost ten percent had no education at all. Mahanama (1998) found that only one person from the 2400 marsh inhabitants had obtained some technical training.

The case below illustrates the difficulties people can have in their effort to make a living and the problems they face in their daily life. The case shows what kind of choices some people make when dealing with economical, environmental and health problems.

The story of Lara and Tony

Lara and Tony are Burghers. Lara is from mixed Sinhalese-Burgher origin and Tony from mixed Portuguese-Dutch origin. They live in Pubudagama, a squatter settlement in the marsh. It was June 1998 when I met them for the first time.

Lara was born in Maliagadde in 1937. Her mother died when she was two years old, she and her sister were raised by their grandmother. They both went to the San Sebastian School because they were Roman Catholics. When she was eleven years old, they moved to a village not far from Muthurajawela. There Lara became an adolescent girl. She met a nice boy who wanted to marry her because she was a beautiful girl then. He worked as a shoemaker. She was 15 years old when they married and she got pregnant when she was 17. Lara had one son and two daughters from this marriage. She had work in the construction of buildings where her job was to make cement. A few years after her second daughter was born, her husband died of typhoid fever in the hospital. Lara moved into her sister's place and worked only now and then in housing construction. She sometimes went with her sister to a club in Colombo where they could dance with foreigners and where they could eat and drink for free. There had been girls who went home with men for two thousand rupees, but Lara had never done that. "It is a sin", she says.

When she was 25 years old, she married Tony, who was only 20 then. It was a love marriage. His parents were against the wedding because Lara had three children already but he had told them that she was the only girl he wanted to marry. For her first wedding she wore a white dress and married in the church, but this time the marriage was very simple without ceremony. Lara became angry with her sister because Tony was not allowed to live in her house, so finally they moved to Muthurajawela. Tony was working at a welding factory and had to travel to Colombo every day. They had three children together and they all lived happily for a long time. The children from Lara's first marriage moved out of the marsh. The two sons of Tony and Lara got married to two sisters and both couples live in Negombo. They had proved to be 'good women' because their bed sheets had bloodstains the night following the wedding. Sometimes a girl is sent to the doctor before she marries, according to Lara, because the family-in-law wants to know her better. If it is suspected that she is not a virgin, she will be rejected. When Lara married there was no dowry as they were too poor. Dowries are for rich people. Her husband had built the house from timber he had bought himself and she had woven *cadjan* sheets made from palm-leaves for the roof.

It was October 1999, when I visited Lara and Tony for the second time. Both their sons had started building a house in the marsh. One in front of the parental dwelling, the other at the back. The sons did not need to pay rent and the children had their (grand) parents nearby to look after them. Tony made knives in his workshop at the back of the compound. There were two expensive machines which he had bought with a loan. One of the machines made the handles whereby a mall forms the heated plastic into a handle. The other machine was cutting and sharpening the knives for which metal sheets were obtained in Colombo. He made different types of knives, big ones and small ones. Tony mainly gets his orders from local shops.

A major problem in the household is that Tony spends all the profit he earns on *kasipu*. Fortunately, he does not become violent when he drinks. Lara and one of her

sons are *Samurdhi*[11] recipients. They get coupons for the value of 350 rupees each per month. With that they can get a monthly ration of basic necessities in the shop. Lara is also getting money from her other son who lives on their compound. During the day she cleans the house and cooks the food with her daughter-in-law. They want to stay in the marsh in spite of the floods because they think that there are much fewer problems here than in Colombo.

It was November 2000 when I saw them again. The flood water had reached their house and I had to put on my boots to get there. Lara was suffering from a cataract. With bad eyesight it was even more difficult for her to go out of the place. Tony was complaining of competition from others in making knives. He used to sell three dozen knives per month to a certain shop. Now he could sell only one dozen per three months to the same shop. Last week he sold eight knives and the week before, when it was holiday, he did not sell any. The repayment of the two machines is almost completed. He already owned one machine. A Burgher friend, who was also his drinking pal, assisted him in the production of the knives.

The actions undertaken by Lara, Tony, and their children, clearly show their struggle to survive and live an independent life. Negative livelihood actions, such as the consumption of *kasipu*, occurs along with constructive actions. Building a dwelling from timber and other natural material, finding jobs and starting a small business are some examples of the latter. Tony managed to pay-off one machine for their knife-making enterprise, trying hard to pay back the instalments for the other machine too. Disease and untimely death are part of their life. They have few complaints about the problems they came across by living in the wetland. However, the sanitary facilities are very poor and their compound gets flooded regularly, and sometimes their house as well. Although Lara has complaints about their poverty, Tony's drinking problem, and her eye disease, they feel happy most of the time and do not want to leave the marsh.

7.3 The resettlers of Awarakatuwa

There were plans from the government and the environmental project to relocate dwellers from the conservation zone to other parts of the wetland to alleviate the burden on the ecosystem. This section describes the relocation of people from the industrial zone to another area nearby.

In connection with the filling of a section of the marsh for mixed urban/industrial purposes, 220 families had to be relocated to a new village (see Figure 7.1). Marsh dwellers from four villages were to be resettled on land reclaimed from the marsh in the vicinity of the Hamilton Canal. Many of them belonged to the most recent settlers who had moved deeper into the marsh. The first settlers were taxi-drivers from Colombo who had colonised the southern rim of the marsh in 1977. The settlers were allotted plots of land (375 square meters) and money, part of which was a loan, to construct a new house along one of the eight lanes in the newly created area named Awarakatuwa.

[11] The Samurdhi authority assists poor people by providing funds or loans that can be put into saving accounts.

Struggles during resettlement

Even before the start of the resettlement of the people from the four villages, there were problems. A survey had shown that the willingness to move was low (33%) in the settlements (Mahanama 1990). The reason was that many settlers had filled-in plots of land over the years on which they had created home-gardens. Also, the old settlements were much closer to work and school than the proposed resettlement site near the Hamilton Canal. Due to a lack of information, the people expected to get a complete house, but the government only provided support for the construction of houses. The model house in the plan cost rupees 60,000 to construct, which was three times as much as the cost of the wooden houses the settlers were using. With the repayment of the loan at an interest rate of 25 percent, the model house was considered too expensive by the marsh dwellers. Many of the relocated families are therefore still living in constructions made of materials from their previous dwellings in the marsh. Just outside Awarakatuwa, at the edge of the sand-filled area, twenty-two households stayed on. The older people from these households have lived on the edge of the marsh for over fifteen years and were unwilling to leave because they had invested so much in their homesteads.

Awarakatuwa is the closest village to this sand-filled area where Shell has built a gas terminal. It is the area where the resettlers once lived. Before the gas plant was constructed, an environmental impact assessment was carried out and discussions were held with the local people. Companies like Shell are not allowed to build fuel storage close to residential areas. They have to keep safety margins. Although the settlements are not closer than 400 meters away, some people are scared the gas tanks will explode or be bombed by terrorists. At night, the plant is protected by a sea of light and admired as well as feared by the marsh dwellers from the surrounding settlements.

A view on Awarakatuwa's neighbours

The place where Shell has built its gas terminal looks more like a desert than a marsh. However, in this small desert you can find beautiful shells laying around the four large silvery gas balls. In 1994 the area was reclaimed with sand from the sea, which was sprayed on the mixed urban zone of Muthurajawela wetland. Most of the gas comes from Singapore. About once a week a ship arrives at a certain place on the coast marked with buoys. The underwater pipeline is connected with a flexible tube, which is attached to one of the buoys, to transport the gas to the terminal. To protect the coral reef at sea and to lead the pipe under the Hamilton canal, the expensive option was chosen for the pipeline, which was to make a horizontal borehole at seven meters depth instead of digging a groove, which was much cheaper. Divers connect the flexible tube to the ship's cargo space when they need to unload the gas. Apart from the shiny gas balls, there is a big tank filled with water on the plot in case a fire has to be extinguished. There is also a small building that stores the electronic heart of the terminal. About every two months, safety exercises are held, sometimes with the local fire department. There are a few security guards at the sand-filled area. At sea, the Navy keeps guard.

The promised land

The people were relocated before the land had been filled completely. Because of a shortage of funds, only half the plots were filled and not to the approved level. The settlers living in their temporary sheds at the sites of the lanes had to wait for more than a year before some more areas were filled. They suffered from severe floods during the rainy season due to the sand filling activities in the adjoining mixed urban zone. Here, the absorbing capacity had dropped, forcing the groundwater to the nearby settlement areas. The people were supposed to

fill the remaining allocated land themselves but were unable to do so because most of the men were day-labourers and did not have the time and the means to carry out the task. So the land behind the houses remained marshland with stagnant water and with increasing pollution.

7.4 Conclusions

The first research question was formulated as: *What resources do vulnerable households in the marsh environment have and how do they use them?* In this chapter, a part of this question was addressed.

Migration and the growing population in the nearby cities have led to an influx of people in the marshes of Muthurajawela wetland. In Sri Lanka, housing problems can be a cause of delay in marriage, but in the marsh area of Muthurajawela the youth have hardly encountered this problem. There is 'free' land available where a house can be constructed and the number of people in the wetland is still increasing, and so is the size of households. The government fulfils only part of its promises and the houses it offers are considered expensive by the people. For the country as a whole, the average household size increased to 5.2 by 1971, due to the slow growth of available housing possibilities. It declined to 4.9 persons by 1981. Declines in household and family size also resulted from declines in fertility. Urban households have been consistently larger because of boarders and domestic servants (Baldwin 1991). As in Muthurajawela, the size of the households at the tea-estates have always been lower than the island's average. The small space in the houses of these areas is one reason for this.

In a poor agricultural country like Sri Lanka, the social welfare of parents is expected to come from their children, who will inherit a part of the families farmland. In most of South Asia, a son, if there is one, will inherit the land, but in Sri Lanka it is possible for daughters to inherit property, although in the case of agricultural land, they usually do not exercise their rights (Pieris and Caldwell 1997). In the wetland, agriculture is hardly viable and plots of land are small. Therefore, when the *binna* system is used here, it is done because tradition dictates so. This custom has little benefit for parties if no land or goods are involved. However, it is clear that in the *binna* system it will be an advantage for women that they can look after their own parents.

The nearby gas industry is not a labour-intensive plant and it is a dangerous place despite the safety measures. Only a few technicians and some trained drivers have found employment there. There is no work for the settlers. In the marsh area, the people need to be very inventive and flexible to make and save money. They take all kinds of initiatives in money-making activities and use local materials, such as *cadjan*, to save money and transport costs.

Figure 8.1


NEGOMBO LAGOON ISLANDS
N
Negmalu
Munnakkare
Siriwardene and Monaco
Wedikande
NEGOMBO LAGOON
Sanctuary Boundary
Road
Main Road
Minor Road
Railway Line
Landuse
Boggy Area\Marsh
Lagoon
Mangroves
Reclaimed Land
River\Oya
Stream\Channel
1 0 1 2 Kilometers
Prepared by: GIS Centre / R&SP Unit / CEA 2001

8 People from the Lagoon

The lagoon area is located in the northern part of the wetland. In the lagoon area, population pressure and health hazards appear to be higher than in the marsh-area. This chapter describes some of the lagoon resources and livelihood of the households. It also presents some data from a socio-economic survey carried out by the team of Professor Dangalle in 1999 among 1200 fishing families[12] that live along the lagoon. For the Negombo Lagoon area, the study carried out by the author focussed on the major islands in the channel of the lagoon. These islands are: Munnakkare, Siriwardene and Monaco, including the few inhabitants of the island of Wedikande.

8.1 The habitat of the lagoon dwellers

The map in Figure 8.1 shows the northern territory of the wetland, the Negombo Lagoon with the estuary opening. The channel segment of the lagoon serves as an anchorage place for several hundred fishing craft. It is a whimsical area known as 'Little Rome', but could also have been called 'Little Venice' because of the many water locations and boats. The lagoon was declared a fishery management area in October 1995. A boundary demarcation to prevent encroachment in the conservation zone is almost completed. However, the lagoon is under constant threat of over-exploitation.

In the past, Negombo Lagoon was an important stopping place for Arabian and later for Portuguese, Dutch and British trading ships. In Negombo and other seaport towns, the main commodities were timber, cotton, rice, raisin, legumes, betel, pepper and opium amongst other merchandise, but also slaves (Raghavan 1961). The Portuguese introduced a tax system to maintain the port and pay the salaries of local officials.

These days, thousands of kilos of fresh fish are unloaded daily in Negombo, which is Sri Lanka's biggest fish production centre. The loads are distributed to local fish markets, to the large number of hotels in the area, or are prepared for export. The livelihood of 3000 households depend on fishing in the lagoon and another 1500 on sea fishing. Although the sea fishermen form a distinct group, many of them live in the wetland conservation zone. For this reason they are included in this chapter.

The morning market is located on a stretch of beach with many cadjan *shelters where mainly female vendors sell their commodities. All kinds of fish like tuna and seer fish but also crabs and tiger prawns are sold here along with vegetables and other products. Standing on the beach at lunchtime, one can see the fleet of traditional canoes with brown sails coming back from sea with their catch. The evening market for the day fishers is at another location. Different types of fish are caught at daytime.*

In the mouth of the lagoon there are several boatyards, and the water looks dirty from oil. The increasing number of fibreglass boats has caused an expansion of piers and landing points over the past years. On the west side of the lagoon is a place where settlers are building about fourteen concrete houses on reclaimed lagoon land. Mangrove has been cut recently for this purpose and one can still see some dying scrubs. Two months before, this area was still lagoon.

[12] Married children who lived with their parents were counted separate.

A bridge must be crossed to reach the major islands located in the channel of the lagoon. The creek at Munnakkare is packed with motor boats in the morning and the fishermen prepare their fishing gear before going home to get some sleep. There are not many trees in Munnakkare compared to the marsh part of the wetland. Instead, it is congested with houses of different sorts. Many noisy crows are flying around, picking refuse from the numerous overfull garbage bins along the roads. Dogs and goats are also eating from the bins. Pigs and poultry are roaming in the waste in search for food.

After crossing another bridge one gets to Siriwardene island. There are a few women busy filling their containers with water from one of the taps at the road. A long row of containers are lined-up behind them. The drains along the roads are often overflowing. Many houses at the edge of the shallow lagoon have filled their muddy backyard with garbage and tree branches to create land.

The area behind the Roman Catholic Church is called Monaco. Many houses here are basically similar as they were designed for a housing project, the money for which came from Monaco in Europe. However, in some parts of this Monaco, settlers have built their dwellings on poles in the water. Recently, Monaco and Wedikande were inter-connected by a dam consisting entirely of garbage and waste from factories. A year before, one had to take a canoe or to wade through the lagoon to set to this peninsula to be able to visit the four households in the mangrove. Millions of mosquito larvae can be spotted in the black stagnant water behind the 35 meter long dam of scrap material.

Scrap-dam between Monaco and Wedikande.

8.2 Among fishermen

Many people living on the islands in the lagoon are fishermen folk descended from seafarers and warriors, called *Karavas*. They arrived from South India centuries ago and adapted to a new life-style. With the arrivals of the Portuguese in Ceylon in the fifteenth century, many *Karavas* converted to Christianity and some of the clan names were exchanged for the surnames by which their descendants are known to this day (Raghavan 1961).

The population in the Negombo area is predominantly Sinhalese and Roman Catholic. The rest is Tamil, who have the Hindu religion, and Moors. Older members of the population speak only Tamil while the younger people speak Sinhalese or a mixture of the two. Almost 75 percent of the population is below the age of 34 years. The women tend to marry between the age 15-19, while men marry when they are between 20 and 24 years old (CEA 1994). According the survey of Dangalle (1999), five percent of the fishermen have no schooling at

all. Almost half the men completed primary school, after which they started fishing. Only seven percent of the fishermen had completed grade ten in school. The two cases below tell us that the path of tradition cannot always be followed.

Sunil of Negombo beach

Sunil was born in a fishing-family but he could not become a fisherman himself as he always got seasick. He tried it three times but became sick during the trips. His father is a Tamil from India and his mother is Sinhalese. Sunil speaks English fluently. His dream was to become an English teacher, but he never had the chance. Now he is doing fishing-related jobs. He does a lot of self-study and visits the library regularly. Now that the elections are on the way, he gives his opinion about the political situation in Negombo. "There are no problems in this area because the people have different backgrounds, they are used to each other and live peacefully together," he says. Sunil is supervising the auctions that take place at the beach whereby the bigger fishes are not weighed but just valued at sight. He explains that the baby hammer-sharks and baby blue sharks, which are displayed on a shelf at the morning market, are unborn sharks that are cut out of the bellies of their mother. They are prepared into a medicine for pregnant mothers, according to him. The fish that is not sold after two days will be cut open and dried in the sun with salt. "You can keep dried fish for about two months", says Sunil, "that makes transportation up-country much easier." The price of a kilo of dried sardines can double in the off-season period.

Menika, a fisherman's daughter

Menika was born in a poor family. Her father was a fisherman, her mother a housewife. They lived in a small hut on one of the lagoon islands. When she was six years old, she went to school and completed grade ten. But at the age of eight she went with her father fishing at sea, usually in the evening, coming back after midnight. Although she liked going out to fish, at daytime in school, she was very tired. Menika knows how to swim and to steer a boat, things not many women are able to do here. When she was twelve, she reached puberty and then her younger sister went fishing with her father. Now, Menika suffers from a poor eye-sight. Apparently, the bright lamps used for fishing have damaged her eyes.

It is clear that Sunil, in the first case, was just not the proper person to become a fisherman. This was not easy for him as a member of a fishing-family. More painful for him must have been his unfulfilled dream of becoming a teacher of English. However, he found himself a suitable job, connected with fishing and sometimes 'teaches' researchers about it, in English. The father of Manike, in the second case, did not feel disadvantaged by not having a son. His two daughters were found to be tough enough to assist him on nocturnal fishing-trips, but he is an exception in the area.

8.3 Sea-fishing as a source of livelihood

The *Karava* had a very good knowledge of navigation and took to fishing in large numbers, although sea-fishing was not a tradition on the island. Ceylonese were primarily involved in agriculture. During the Dutch period, the *Karava* possessed parallel ranks to those of the *Govigama,* the cultivating caste. The *Karava* chiefs were known as *mahavidana*, corresponding to the military rank of *mudaliyar* (chief administrator*)* (Raghavan 1961).

Traditional sailing vessels made out of wood are still used for fishing. One of the vessels used is the catamaran, which is a Tamil word for 'tied logs'. Usually, this keel-less craft is made of wooden logs from the mango or jak tree. The logs are generally eight meters in length and are tied together with coir rope (fibres from the coconut). They have a triangular sail attached to a short mast. The smaller version is the *theppam*, which is only two to three meters long. One method of traditional sea fishing, which originates from India, is described below. Although the cultural value of this way of fishing is high and no motor is used on this craft, the method is destructive to the sea bottom.

Traditional fishing at sea

The boat

The *ruwal oru* is a large canoe, about seven meters long, with a large brown sail. The building of a *ruwal oru* is traditionally a family business. Nowadays only the frame and the outrigger are made of wood while the boat itself is often constructed out of fibre-glass. It is used in shrimp and fish-trawling. The sails have been rubbed with tincture from the branches of the mangrove scrub that turns them reddish brown. It helps to protect the sails. Every now and then a new white strip of material is added to the rectangle sail, while at the other end of the sail an old brown piece of material is removed. In this way, the costly sail does not need to be replaced at once.

The method

Every day, except when the weather is bad, a fleet of about 25 *ruwal oru* leave Negombo early in the morning to go out to sea, returning with their catch around noon. Each boat has four men, one of them is usually the boat owner. Standing in the narrow boat, two men operate an oar each, while another uses a punting pole to get out of the lagoon. Once the sail catches wind, a loose rudder is used for steering. A round net is attached to the boat and dropped into the sea with heavy stones at one side of the net. The weight of the stones pull the net to the sea bottom, while the rest of the net is spreading out. Every half an hour the net is emptied and the catch sorted out on the bamboo platform, which is constructed between the poles of the outriggers. The sail is kept wet with a half-circle shaped scoop to tighten the sail and catch more wind.

Organisation

On board there is no clear division of labour. Generally, the boat owner is in the back of the boat operating the rudder but he also helps sorting out the fish. Two helpers bring the catch to the market on the beach where it is sold traditionally by women but these days by men as well. There is a fishery management organisation for traditional crafts at Negombo, but membership is not prescribed. Although everyone can arrange a permit to start this type of fishing, the tradition is often passed on from father to son.

Catch and costs

The catch consists mainly of shrimp and prawns but also flatfish, eel, crabs and rubbish. The fish unloaded after the trips is much less nowadays and many young people look for other jobs. The value of a good catch these days is about 2,000 rupees, but more often than not the yields do not reach beyond 1,000 rupees per day. The boat-owner will receive 40 percent and his assistants, 20 percent each of the revenue. But this can be different if nets are used from the assistant fishermen. A net used for this fishing method costs around 1,500 rupees and the *ruwal oru* itself has a value of

about 1½ lakhs (150,000 Sri Lankan rupees). A cotton sail has a value of 3,000 rupees.

Nowadays, most of the sea-fishing is done in mechanised crafts made out of fibre-glass, a long lasting and easy to maintain material. The fishermen with motorboats go out for about 8 hours per day or night. At night, strong light bundles are used to attract the fish. Trawlers go very far, staying at sea for a long period of time. There is crushed ice on board in fish holds to keep the fish fresh. The journey takes a long time but the load of big fish they bring back, sometimes has a value of Rs.10 lakhs (about 1,300 US dollars).The fishermen who use trawlers need to pay commission to the harbour authorities. The profit is shared on a fifty percent base with the boat-owner. The other half is divided among the crew. Sea-fishermen need to be a member of the Negombo South Fishermen Cooperative Society to be allowed to sell their catch on the market. A considerable quantity of the sea-fish is used for dry fish production, particularly shark.

Shark harbour

Trawlers arrive in Negombo between 3:00 and 7:00 in the morning after being at sea for several weeks. They unload hundreds of sharks. The sharks have been on the bottom of the boat after being caught and are stored on ice-blocks. Cutting up the fish starts as soon as the boats have arrived in the harbour and is done on the dirty ground. Fins are cut off and prepared for export to China. The headless sharks are loaded into a small pick-up tractor and taken away for further processing. By-products from the cutting and cleaning of the sharks are heads and guts, which are treated as waste. They are dumped in the channel and taken into the lagoon by the high tide where dogs eat parts of the fish waste that drift ashore on sandbanks in the lagoon mouth. It is estimated that each year about 50,000 kilograms of shark waste is deposited in the lagoon. The IRMP, together with the fishery co-operative and NGOs are preparing a collecting system for the fish waste which can be used as pig food.

8.4 Lagoon-fishing as a source of livelihood

The majority of the lagoon fishermen are from traditional villages along the banks and from a few islands at the mouth of the lagoon. Of the total number of lagoon fishermen, nearly three-quarters followed their fathers into their jobs (Dangalle 1999). The average age of the lagoon fisherman is 37 years with an average experience in lagoon fishery of 18 years. The main reason for young fishermen to engage in lagoon fishery is poverty. They needed a daily income and finding other jobs was very difficult. Helping their fathers was another reason for becoming a lagoon fisherman.

About twenty years ago, the entire family income derived from the lagoon fishery, but now lagoon fish and shrimp catches have diminished and the number of fishermen is no longer in balance with what the lagoon is able to produce. For a few months of the year, many fishermen also work in the sea-fishing industry. This is a relatively quiet period with little pressure on the lagoon habitat. However, the civil war makes many fishermen from the north migrate southwards in search of fishing-related jobs. Also the influx of people from other areas of the country resulted in the loss of temporary jobs in the fishing industry for the lagoon fishermen. Today, they are solely dependent on lagoon fishing which has a negative effect on the fish population.

The main reasons given by the fishermen for the decline in income from lagoon fishery were: too many fishermen (43%), declining fish resources due to pollution (24%), harmful fishing methods (19%), and destruction of mangroves (2.5%) (Dangalle 1999). The four main reasons given for continuation of lagoon fishery were: no other job available (54%), traditional occupation (18%), cannot do another job (9%), it is an easy job with freedom (4%).

There are different fishing-methods in the lagoon, some of which are only restricted to a few families. The methods used in the lagoon are stake-net, push-net, trammel or disco-net, gill-net, drag-net, cast-net, brush-pile, hook and line, and fishing by trawl. The trawl and push-net are the most harmful methods used in the lagoon. The majority of the households used a combination of methods. The people who fish only with push-nets are the most impoverished and require special support if they are to abstain from using this damaging gear. Different fishery cooperatives around the lagoon coordinate the fishing activities in the lagoon (CEA 1994).

In 1999, the methods most frequently used were fishing by cast-net (47%) and trammel nets (46%). Some fishing methods are used in combination with other ways of fishing. Some of the fishing methods in the lagoon are used with canoes. Most of the fishermen do not own a vessel, but hire or share one. Other types of small boats are also used for fishing in the lagoon. One lagoon fishing method, namely stake-net fishing, will be described in more detail. It is an example of sustainable use of the environment.

Stake-net fishing

This fishing method, in Sri Lanka called *kattudel*, which allegedly has its origin in ancient China, is very much in harmony with ecology. The method can only be inherited along the male line of a stake-net fishing family and only by one member of such a family. Married men who are descendants of a stake-net fisherman are entitled to take part in the *kattudel*. The applicant must demonstrate his capacity to use a stake-net and he must have access to an outrigger canoe, a net, and enough poles for fixing the net. If there is no male descendant, the right of inheritance in a family ends with the death of the last male member.

Social organisation

Stake-net communities are highly organised and members are proud and disciplined. The four Kattudel Fishery Associations (KFA's) in Negombo work according to agreed codes of conduct. Only members of the four stake-net societies have access to the about 22 stake-net fishing locations (*padu*) in the lagoon. At some of the larger *padu's*, nets can be fixed by different members, which brings the total number of sites to 62 (CEA 1994). Access to the locations is decided through a lottery during the annual meeting for the stake-net societies (*pelle*) held in March, except for the Pitipana society, which has daily access to particular sites. Each of the remaining three societies has access to the fishing locations, once every three days.

Day 1: Duwa street KFA
Day 2: Sea street KFA
Day 3: Grand street KFA

The total membership in the stake-net fishery societies is estimated at 500.

The method

In the beginning of the evening, just before ebb tide, the fisherman and his assistant or son will go to their location in a canoe. Once at his *padu*, the fisherman will start putting about 10 long poles in a V form in the ground with the wider side facing the lagoon and the point directing towards the sea. Ramming the poles in the lagoon floor, while standing in the canoe, is a very heavy job. The stake-net, which is about 35 meters long, is fixed to the poles and a funnel-net is fixed in the point of the V. The fish is driven into the funnel-net by the water flow from the lagoon. The fishing method can only be operated in channels with a depth of between three and four meters. In shallower or in deeper sites, the net cannot be fixed properly.

Kattudel fishing in the lagoon channel.

The stake-net fisher canoes carry two lights as a warning for other boats (to prevent them from damaging the expensive fishing nets), and to be able to sort out the fish. The lights are made of blackened kettles filled with petrol and a piece of cotton stuffed in the mouth-part, which is lit. Roughly every half an hour, the funnel-net is emptied in the canoe and the helper starts sorting out the fish. The crabs and bigger fish are put in separate baskets, while the shrimp and small fish are kept in the boat. Tiny fish, and the baby puffer fish, are thrown back into the sea together with any rubbish that is caught in the nets. These days many plastic bags, sometimes filled with garbage, are caught in the nets. Like coconut shells, the rubbish can easily damage the nets. After six hours, when the tide starts changing, the fishing is over and the net and poles are removed. The catch is marketed early in the morning.

Costs and benefits

Shrimp and fish production from the stake-nets varies seasonally. The highest production occurs in April/May and in October/November in which the produce in one night can be a canoe full of fish with a value of around 30,000 rupees. The income from each stake-net catch is divided as follows:

Crew	90%
Auctioneer	3%
Saving for fisherman's future	3%
Church	4%

The KFA members are directly dependent on the fishery for a regular income and, because some sites are not as profitable as others, the societies have rules for site

rotation. However, sedimentation has already caused a loss of some stake-net stations over the past 35 years. The Roman Catholic Church plays an important role in the welfare, regulations, and enforcement of penalties (CEA 1994).

Fishermen who do not own a boat or net must rent the equipment. The payment to the church and the savings fund are utilised for welfare activities:

- A payment of Rs. 3,000 for funeral expenses of a KFA member.
- When catches are low, the entire sum collected is divided among the members who drew a particular number in the lottery at the annual meeting.
- A monthly allowance is paid to widows of KFA members for a period of 12 months.

8.5 Harmful fishing methods

The general view of the users of the lagoon is that it must be protected. Especially the older fishermen are convinced that the environment of the lagoon has deteriorated and that steps have to be taken to protect it from further damage. They complain that the younger generation has adopted harmful fishing-methods and that younger fishermen see the lagoon as a sort of bank from which withdrawals can be made without returning any deposit. Most of the fishermen feel that the methods they are using are not harmful to the environment (92%) (Dangalle 1999). Only seven percent admit that their methods are causing destruction but say they see no other possibilities. One percent had no clear idea of the effects of their methods. The lagoon fishermen feel that some of the methods used by others have a serious effect on the lagoon. Fishermen in the southern part of the lagoon complain that the use of trawl nets by their colleagues in the northern part is extremely harmful. Meanwhile, fishermen in the northern part accuse their counterparts in the south of destroying the fish stock by using trammel and push-nets.

Livelihood alternatives

Alternatives to destructive fishing methods could include adopting a new fishing method or finding another way to make a living. An occupation other than fishing is difficult for the lagoon fishermen to accept. Marine fishing is an acceptable alternative if the necessary support is provided, including access to boats, gear and marketing. The majority of the fishermen would like to adopt other methods of fishing, even though they do not admit that the method they employ is harmful. They are eager to learn about other methods that are more productive. Another way to protect the lagoon is to minimise the number of lagoon fishermen. About fifty percent of the fishermen, especially the younger ones, accept other forms of employment and are willing to undergo training for another profession. Many fishermen or members of their family have experience in other activities such as masonry, carpentry, motor repairing, poultry and piggery. As long as they do not have to leave their area of residence, they welcome further training.

8.6 Conclusions

The research question relevant to this chapter was: *What resources do vulnerable households in the lagoon environment have and how do they use them?* The remainder of this question will be addressed in Chapter 9.

The Negombo Lagoon is under threat from the consequences of development activities in the area such as pollution, destruction of mangroves, reclamation and harmful fishing methods.

This results in a reduction of natural resources. Some of the traditional fishing methods are environmentally friendly but strong measures have to be taken to stop the increasing use of destructive fishing methods. Sea-fishing is an important sector of industry in Sri Lanka, but also has a negative impact on the ecosystem, that of the lagoon in particular.

Households depending on a harmful type of fishing for their livelihood will find themselves in an increasingly untenable situation. Due to the destructive impact on the environment, these fishermen are under pressure to find other jobs. An encouraging sign is that a large number of fishermen, especially the younger ones, are willing to change their occupation, provided it will improve their living standards. The organisation of some sea and lagoon fishing methods have a centuries-long history. However, the existence of, for example, the stake-net fishery is only viable if it continues to be profitable. The organisational structure for this fishing method will begin to collapse if the yields begin to decline. A loss of stake-net stations would be one of the most important contributing factors to end this type of fishery. The actual financial loss could probably be compensated, but not the cultural loss. Therefore, efforts need to be undertaken to prevent loss of stake-net stations and to rehabilitate stations that are out of operation already.

9 Livelihoods in the Wetland

This chapter presents information on the household structure and the financial situation of the wetland population. It first describes the households' resources, assets and liabilities. Secondly, the livelihood strategies and coping mechanisms of the wetland dwellers are discussed. Alcoholism, floods and illegal activities are also described because these may jeopardise households' livelihoods. Most of the data presented in this chapter are from the livelihood survey, comprising a sample of 100 households in the wetland.

9.1 Household composition

The average household size in the sample of the livelihood survey was 4.7, comparable to the country's average of 4.5 in 1994 (Arjuna 1997). Lagoon households seem to be larger on average, but the numbers are too small to make meaningful comparisons. Ten out of the hundred visited households were female-headed. Most of the household heads were married (89%). One household head was single and four were divorced or separated. Six heads of households were widowed.

Table 9.1 Household size

Household members	**Marsh (households)**	**Lagoon (households)**	**Total frequency [also %]**
1 – 3	26	3	29
4 - 6	34	23	57
7 - 9	8	3	11
10 ≥	2	1	3
Total households	70	30	100
Average size	*4.4*	*5.4*	*4,7*

Source: Livelihood household survey.

Table 9.1 shows that far more marsh households fall into the first category of 1 to 3 members (37%) than the lagoon area, where only three families had between 1 to 3 members. As much as 77 percent of the household sample in the lagoon contained 4 to 6 members (23 households). Table 9.2, shows a large difference in the first age group between the two areas.

Table 9.2 Household composition

Ages of household members	**Marsh**		**Lagoon**		**Total frequency**	**Total percent**
0 - 4	40	13%	11	7%	51	11
5 - 14	40	13%	30	19%	70	15
15 - 64	216	69%	115	71%	331	70
65≥	15	5%	5	3%	20	4
Total	311	100%	161	100%	472	100

Source: Livelihood household survey.

The percentage of under fives (0 - 4 years) in the marsh area is twice that of the lagoon area. However, in the age category 5 –14 years, the lagoon area counts more persons, resulting in 26 percent for both areas in the combined age category of 0 – 14. The reason for the differences between the two areas could be that the lagoon islands are longer inhabited than

the marsh area. Also, the density of houses at the lagoon islands is higher, so it is not easy to construct a new dwelling. Therefore, young people in the lagoon area are forced to stay longer with their parents, even when they get married. As stated before, people moved into the marsh area more recently, and house density there is lower. The smaller household size in the marsh has to be explained by these factors.

9.2 Livelihood resources

The households in the sample derived their money from different sources. Apart from employment, income was also obtained through loans and from pawn shops. In general, the wife in the household decides on how the money should be spent (68%). Both man and wife decide where the money goes in 11 households, and other members or a combination of members decide on financial matters in the remaining households.

Three out of the hundred families had no employment at all. The majority of the households had an income from one activity (56%). Thirty-two households had an income from two jobs and nine households managed to generate money from three activities. The average income of the head of the household was Rs 2,700 per month[13]. The average household income in the marsh area did not differ significantly from that in the lagoon area (Table 9.3).

Table 9.3 Average household income in the marsh and lagoon areas

Marsh	**Lagoon**	**Average income for both areas**
Rs 5,380	Rs 4,752	Rs 5,190

Source: Livelihood household survey.

The table below presents the household income distribution for the total wetland sample.

Table 9.4 Contribution to household income by household members

Monthly income in SL rupees	**Household head (%)**	**Total other household members (%)**
0 - 500	22	5
500 - 2,000	23	15
2,100 - 7,000	53	54
7,100 - 10,000	2	12
> 10,000	0	14
Total	100	100

Source: Livelihood household survey.

Almost half of the wetland household heads derived an income as a daily labourer (48%). This means that they were often unemployed and that they would take any job that comes their way, mainly unskilled manual labour work, which could be self-initiated. Coolie, peat cutter or fishing-related jobs were common activities in the marsh. Twenty-two percent of those employed were fishermen, mainly living on the lagoon islands. The remaining 30 percent were skilled labourers, traders, drivers, or workers in the industry.

[13] The exchange rate was more or less 75 SL rupees for one U.S. dollar at the time of the survey

Expensive job

Designation: Supervisor	
Basic Salary	2275.00
No pay days	4.00
No pay amount	350.00
Gross tor Epf	1925.00
Normal DIT amount	0.00
Special DIT amount	0.00
Allowances	
Poya	43.75
Travelling	253.85
Special	0.00
Holiday	0.00
Gross Salary	2222.60
Deductions	
E.P.F 8%	154.00
Salary advance	1000.00
Net Salary	1068.60

The salary slip left is from Ramesh, a 27-year-old man who lives in the resettlement village Awarakatuwa with his parents. He worked as a supervisor for a Sri Lankan company in Chilaw. The salary slip, which is from November 1998, shows his basic salary of SL rupees 2,275. He received only a small allowance for Poya-days and 253.85 rupees per month for travel. However, to travel the distance from Awarakatuwa to Chilaw, which is about 60 km and back, cost him almost 100 rupees a day. His father was paying that amount for him in the beginning, but as the travel costs equalled almost his salary, he finally quit his job. He is now without employment and will not be able to marry soon.

9.3 Household resources

No particular benefits are obtained from the wetland, according to the majority (53%) of the respondents. A few households use material, such as peat, sand, sticks, and palm-leaves from the wetland for house construction. Sixteen women mentioned that they got food from it, like fish, crabs and shrimp. Eleven percent gathered firewood or mangrove branches in the marsh. Officially it is prohibited to cut mangrove but cutting small quantities from scrubs that grow near people's houses is an accepted practice. Sticks from mangrove are used for brush-pile fishing, but also for fencing a household's compound.

Marsh dwellers with collected building materials to improve their house.

Ownership of houses or land represents a nebulous category in Muthurajawela's conservation zone. The majority of the families (65%) said they were illegal residents. Thirteen respondents did not know whether they were living there illegally, and 22 percent claimed to be legal residents. Documents on land tenure were often obtained from, or promised by local politicians.

Selling the dwelling
Forty percent of the respondents of the households visited had no idea how much their house was worth. Sixteen percent answered that selling the house was not possible. The remaining 44 percent could give a figure ranging between 2,000 and 600,000 rupees for the material value of the house although the majority of them claimed that selling could not be done without the necessary papers.

9.4 Household assets

In general, the valuable items in the household serve all the members. However, when asked specifically, most of the household goods were said to be the property of the household head. This even applied to items like sewing machines and jewellery, although men do usually not use these. Table 9.5 gives a general overview of household assets. Livestock consisted mainly of small animals like chicken, pigs or goats. 'Other items' could be a piece of furniture, a fan, a cart, or fishing gear.

Table 9.5 Assets owned by the household members

Assets	**Head of household**	**Total other members**
No assets	19	277
Jewellery	64	8
Radio	48	8
Pushbike	45	9
TV	40	10
Livestock	20	
Sewing machine	19	2
Refrigerator	9	1
Land	5	6
Motorbike	5	
Boat	4	
Other items	17	11

Source: Livelihood household survey.
(The total number of household members in the survey was 472).

Saving and credit schemes
Sri Lanka savings and credit cooperatives, SANASA, collect savings from members and disburse the savings as loans. They have successfully targeted the poor, including women, who made up over 50 percent of the membership by 1990. SANASA loans have been offered to women to begin an income-generating activity, and to small farmers to avoid moneylenders (Hulme and Montgomery 1993). In the wetland, SANASA was involved in housing development in the channel segment of the lagoon through the provision of funds, although the legitimacy of the service in this sensitive area was questionable. The organisation also provided loans to the inhabitants of Munnakkare and Siriwardene islands to pay for the connection of electricity.

In general, the use of credit cooperatives and banking services is low. The majority of the people go to a pawn shop and some to a moneylender to obtain capital. In Chapter 13, the income-generating program of the IRMP is discussed, which forms an integral part of the development and conservation program. In this section the saving behaviour of the marsh and lagoon inhabitants is discussed, as well as the use of pawn shops.

The households of the lagoon islands saved three times more on average than the marsh dwellers, while they earned slightly less (Tables 9.3 and 9.6). We have seen that in the lagoon area also the household size was bigger (Table 9.1), meaning that the lagoon families had more people to take care of. The reason why the island households saved more money might be that people have lived there for a longer period of time than the settlers in the marshes. They could start saving at a time the fish-catches were more abundant and also yielded more profit. Another reason is that Negombo lies at walking distance from the islands, thus making transport costs to the city negligible. Negombo also provides better and more reliable saving possibilities. Besides, saving is more common in fishing families, where the men are often away for a long period of time.

Table 9.6 Average household savings in the marsh and lagoon areas

Marsh	**Lagoon**	**Average saving for both areas**
Rs 2,423	Rs 6,627	Rs 3,685

Source: Livelihood household survey.

Table 9.7 shows that only a quarter of the household heads had saved a little money. The family as a whole did better in saving money.

Table 9.7 Household savings

Savings in SL rupees	**Household head (%)**	**Total household (%)**
No savings	74	35
100 - 1,200	22	35
1,300 - 10,000	4	22
> 10,000	0	8
Total	100	100

Source: Livelihood household survey.

Saving in the family

Wasanthi is a 32-year-old mother of three. Her husband, a daily labourer, earns about 2,300 rupees a month. He is the only person working in the household. Her mother, who is a 65-year-old widow, also lives with them. Her husband has a bank account, but Wasanthi does not know the exact balance. It cannot be much, she assures us. Her two sons of 15 and 12 and her daughter of only 6 months, have an account at the Ceylan Bank. This bank stimulates children to save money. After saving for some years the child will get a schoolbag and at a later stage a bicycle. Wasanthi shows us the saving booklets that have a pink colour and a picture of a rabbit eating a carrot, on the cover. On top is written *Tikiri*, the name of the saving system and below is written "Savings Pass Book". The eldest son has 600 rupees, Vimukthi of 12 years old has 580, and the baby girl has 200 rupees, which is the minimum deposit. No one other

than the children themselves can withdraw the money but only when they are 18 years of age.

Apart from the Tikiri saving system, mentioned in the case above, the Ceylan Bank also provides Tikiri funds to assist young account holders who are in urgent need of medical care. They also give rewards to children who represent the country in an international cultural or sports event. Tikiri account holders who obtain the highest results in the A-level examination in their schools receive a grant as a reward for their achievements.

Debts

Only one quarter of the interviewed households had no debts. Not having a debt could roughly mean two things, people had enough income to pay their bills and buy the items needed, or they were too poor to borrow money, knowing they would never be able to pay it back. Debts to more than one creditor are not rare. The majority of the people with debts owed money to shops (64%). Some households had also debts to municipal institutions such as the electricity board.

According to Mahanama's survey (1998), 23 percent of loans obtained by the marsh dwellers are without interest. Almost half of the inhabitants (47%) pay between 2 and 9 percent interest, and 31 percent of them pay between 10 and 20 percent interest. The purpose of the loans was not given in 17 percent of the cases. For half the households (48%) the loan was used to pay for daily needs, and for 17 percent to construct or improve the house. More than ten percent needed money to start a small business. A few households needed a loan in order to go abroad for employment, to buy medicine, or to pay for funeral expenses. Some households were able to obtain a loan after presenting a deed or mortgage of land or house, or a guarantee from the employer. None of the households visited had lent money to others. In Sri Lankan culture, personal lending is often taken as gift-giving, something the predominantly poor families in the wetland cannot afford.

Pawn shops

Many people in the wetland go to a pawn shops to get a loan in exchange for jewellery. Out of the 100 households visited in the wetland, 77 had ever been to such a shop and a few had been to a moneylender. The majority had visited a pawn shop more than once during the past year. Sometimes the pawn shop was visited just to pay the interest of an item already there lest the debt would increase, and in a few cases a piece of jewellery was bought back. A pawn shop may sell the pawned jewellery after one year. They usually charge ten percent interest per year in case the item is bought back by the customer. In the year before the household interview, only nine women were able to buy their jewellery back from the pawn shop, for which amounts were received ranging between 665 and 10,000 Sri Lankan rupees.

Table 9.8 Total indebtedness of households in SL rupees

Debts to shops, bank and others	**Frequency (also %)**		**Indebted to pawn shop for deposited jewellery**	**Frequency (also %)**
No debts	24		No debts	25
< 1,200	26		< 1,200	13
1,200 - 10,000	40		1,200 - 10,000	51
10,000 - 40,000	9		10,000 - 40,000	11
250,000	1			
Total	100		Total	100

Source: Livelihood household survey.

Support systems
Some of the wetland inhabitants received assistance through a well-known system of support in Sri Lanka: the 'Samurdhi' movement. It assists low-income groups in the event of childbirth, marriage, death of a family member or other emergencies. The Samurdhi Lanka Fund has been set up with profits earned from trade to assist poor people to overcome their housing problem. They also provide credit to the so-called members of 'Small Samurdhi Groups'. About 900 of these SBS's (Samurdhi Bank Societies) have been set up nation-wide.

The poverty alleviation program from the government called 'Janasaviya', originated as a result of the increasing awareness that poverty and the plight of the poor was a source of social tension. The families most affected by the reduction of subsidies are to benefit from the program. They are entitled to a monthly income of Rs. 2,500, divided into a consumption and an investment portion, for a period of two years. Different rounds have been completed since 1989. Linked to this is the support of programs such as the provision of food stamps and free mid-day meals. Families in Sri Lanka with a total income less than Rs. 750 per month are entitled to food stamps. The CEA (1994) found that there are relatively more food stamp-receiving families in the northern part of the marsh. Administration and distribution of support are processed through Grama Niladari's14 or Urban Councils. The Roman Catholic Church and community-based organisations have provided assistance in the area for a long time (see also Appendix 3).

Family and marriage
In the wetland patrilocal (*diga*), matrilocal (*binna)* and neolocal marriage arrangements exist. In Sri Lanka, marriages are generally patrilocal in which the wife lives and works on the land of the husband's family.

In the country as a whole, arranged marriages are probably still more common than 'love marriages' (Baker 1998). More often than not, Sinhalese middle-class couples have found each other through a newspaper advertisement under the heading 'Marriage Proposals'. The advertisements usually provide information on education, religion, salary, assets, and occupation, and often also on a person's horoscope to check on astrological compatibility. This is different in Muthurajawela wetland, where people are too poor to afford official marriage brokering and expensive weddings. However, parents do try to find a good match for their children within their own social and religious circles. It is common for kin in the island to live near each other so that in case of problems support can be solicited from family members. This holds even more for the wetland population, although land scarcity on the peninsula near Negombo makes living in the same compound very difficult.

The story of Padma illustrates the many concerns in the life of the wetland dwellers discussed in this chapter. It shows how Padma and her husband deal with debts and other problems that arise and the choices they have to make in finding solutions. It also illustrates the role of family, relatives and the church.

> Life story of Padma
>
> Padma is a 30-year old woman who lives in Monaco in a clean small house with her two children. It was March 1999 when I first visited her. In her little garden she had

[14] Governmental officer at village level who does administrative jobs and provide permits to local people.

many flowers in pots and a well-organised washing place for clothes. In one corner was a cement pit latrine. Her husband Nimal joined his mother in Italy six months ago because there were no job opportunities for him here. It appears that he has not found a proper job in Italy yet (Padma starts crying). He had borrowed nine lakh (900,000 rupees) from a friend for the trip. He had to make a promise in the church that he would return the money. His mother had started working in Italy as a maid and got a visa only after one year.

Padma fell in love with her husband when she was 22 years old. Her parents did not agree with the wedding because he had no job and a jobless man should not get married in Sri Lanka. The couple escaped to an uncle in Kandy where they got registered as a couple. After a few months in Kandy, they returned to Negombo because her father became ill. He had missed his daughter very much. Her parents arranged a church ceremony for them and her husband found work as a coolie. He also assisted in masonry, which earned him 100 rupees per day. The couple stayed for five months with their parents. Padma went to work in a factory in Colombo, where she earned Rs. 500 per month. Nowadays garment factories pay about 3,000 to 4,000 rupees per month.

After the couple had other problems with Padma's parents, they moved to the other side of Negombo, close to the beach. They rented a room and after one year of marriage Padma became pregnant with their son. She stopped working at the factory. Because she had not taken rest in the beginning, she became ill and was hospitalised for a while. She had to take many pills and she blames these pills for her son's memory problems. Her husband had to do everything during the pregnancy because they were still at odds with her mother. She had a normal birth at Negombo hospital. After the baby was born her parents started visiting them again. Nimal's parents asked the young couple to build a house near the bridge in front of their own house. This they did, but after they had lived there for three months, Nimal's brother got jealous. He could not stand that the land had been offered to them and not to him.

Consequently, they left for Kurunegala to stay with an uncle of Nimal's. He started a bicycle repair shop and learned the skills on the job. They stayed for one year in Kurenegala but wanted to return to the Negombo area and asked a priest for land on the lagoon islands. The priest promised them land at Monaco if they attended the church meetings. They went to church every Friday and Sunday. The priest liked her husband and he provided the rocks to fill a piece of lagoon area in Monaco. They themselves began to build the house and ate less in order to buy the material for their house. They worked very hard but a government official came to inspect and objected to the construction. The couple went to the priest who explained to the official how poor they were and that they had no other place to go. The official then gave them permission to continue with the building work. Her husband worked only on Sundays at the house as he had started to work in masonry again. They used cement, stones and ready-made grey blocks, which they got from a friend who also lent them 5,000 rupees. They completed the house but after four months they were hit by floods in their home. That was in December just before Christmas. They raised the floor of the house and also began to build an elevated pit-latrine. Other people also started using the latrine, because their household was one of the first in Monaco that owned one. Her husband objected since he was the one who was fetching water for flushing the toilet.

After a two years' stay in Monaco, Padma became pregnant with her daughter. They were happy with the children. Her mother-in-law tried to get a visa for Italy for her son, but without success. He then went by ship to Italy as an illegal immigrant but he got caught by the police and was imprisoned. The first half year he could not send any money home. He also could not pay back the amount he had borrowed for the journey. Only a few temporary jobs came his way but after a while he was very lucky when he won about Rs 10,000 in the lottery. He paid back the debts and sent money to Padma. He had no visa yet but had requested one. Only when he gets a resident permit can he come to Sri Lanka and return to Italy without any problems.

Kitchen and bedroom with mosquito nets in Padma's house.

A year later, on 14 February 2000, I visited Padma again at her parents' place in Siriwardene. She was not the happy looking woman she was the first time I met her. I could see from her eyes that something has shattered her. She told us that she moved here with her two children a few months ago because something bad had happened to her. A man, an alcoholic who lives close to her in Monaco, had sneaked into the house one evening after she had accompanied her father to the road, and raped her. Afterwards the man had apologised and asked her not to go to the police but she did go to the police. She wanted to go to court and claim Rs 5,000 from the rapist. She called her husband in Italy but he advised her not to take the case to court as it would make the intruder very angry and she would be in danger. The rapist and his friends could come to her house and do something bad to her or the children, even kill her. He had said that they had no choice but to stay in Monaco and to live there peacefully. So she went with the children to her parents' place. She tells about the hospital where friends of the rapist had intruded and humiliated nurses. One nurse was pressed to the ground. The hospital staff went on strike after that incident.

Padma had no plans for the future. She hoped that her husband would get a visa soon. She went back to the house every day to check on it. The many plants in pots had

withered away after one month, but inside the house everything was still in order. There are many jealous people who want to destroy other families, she explains. They spread rumours and they could make her husband believe that she is a bad woman. She is scared to live there alone. Last month a girl of seven was raped. They went to the police and one suspect is now in prison. Alcohol is the reason, she says, and drugs.

In January 2001 Padma still lived at her parents' place in Siriwardene with her two children. Her husband had obtained a residence permit for Italy and she wanted to join him. She was in the process of getting the papers ready for Italy. She was planning to leave her daughter with her parents but to take the boy with her to Italy. He had been suffering with asthma and has been very ill. Padma's husband would first come from Italy to Sri Lanka for a few months. Hopefully they can sell their house in Monaco. In May 2001, I heard that Padma had left for Italy with her husband and son. Her daughter stayed behind and is being taken care of by her parents.

It is clear from the case above that the young couple has an enormous drive to make the best of their life. They are poor, but good managers of their household and they are not afraid to take risks. In order to improve their livelihood, they borrowed a large amount of money and even tried to make a living abroad as illegal immigrants. The price they paid for going abroad and strengthen the household economy was the separation from their daughter. The rape incident shows how alcoholism, even when not in the own family, can ruin a person's life. It is not surprising that women commit suicide, as often happens, after loosing their honour, dignity and self esteem. The fact that Padma was discouraged from reporting the incident to the police illustrates that women rights in Sri Lanka are not as strong as one would like to believe. Many rapists are only fined for a small amount. Just a few serious offenders are punished by being sent to a re-education camp.

9.5 Illegal coping mechanisms

Absent and missing breadwinners

Many trawlers go out for deep-sea fishing in the territorial waters of other countries. They go to the Maldives, India, Bangladesh, and even to Australia. Sometimes the argonauts stay away for a month so their trips involve elaborate preparation. They take a few hundred kilos of rice, loads of coconuts and enough drinking water for a crew of about six men. The seafarers set off with prayers to appropriate saints, asking them that they will not encounter hardships at sea and will return safely to the Negombo Lagoon. Apart from bad weather, it sometimes happens that the LTTE[15] in the northern territory of Sri Lanka captures ships. It often happens that the boat is seized by the authorities of other countries and the crew is arrested for illegal fishing. Usually these fishermen return safely to their base after spending between a half to one year in a foreign jail. Some trawlers never return. Between 1995 and 1997, 207 Sri Lankan fishing boats, with more than 650 fishermen on board had been reported missing or arrested according to the Ministry of Fisheries and Aquatic Resources. The government spends a lot of money on securing the release of fishermen and their boats, and to support the families of the arrested fishermen as the livelihood of these families are severely affected by the missing 'breadwinners'.

[15] LTTE = Liberation Tigers of Tamil Elan, the group that fights for an independent state in the North and East of Sri Lanka.

Oil pollution
Boats produce up to 20 litres of waste oil, which needs to be changed about once a month. Currently, the used oil is dumped into the lagoon. Rules and regulations exist but are not enforced. The Negombo South Fishermen Cooperative Society, together with IRMP will set-up a system to collect the waste oil, which can be used as a wood protector and also in the glass and aluminium industry. Jetties need to be constructed for the boats to anchor, but there is a lack of money to realise this. There is little willingness to pay for the collection of waste oil. However, there is already a small wooden house on poles in the water where the old oil is collected for free.

Smuggling
Smuggling is taking place into and out of the country. Products from the marihuana plantations inland are transported to the coast where boats are waiting. Because of the many roadblocks and checkpoints around Colombo and Negombo, the transport of marihuana around the wetland only takes place on a small scale. Saris[16] from India are very popular in Sri Lanka. They are smuggled into the country to avoid customs duty. Gold is another contraband exchanged between Middle Eastern countries, the Maldives and Sri Lanka.

Turtle catching
Illegal killing of turtles takes place in the wetland area. When a fisherman gets a turtle in his fishing nets, he is supposed to set it free again. However, each day approximately 15 to 20 of these endangered animals are slaughtered, as turtle meat is a favourite food for many. Selling the meat is easy and does not take place in the open market. It is therefore difficult for the authorities to stop this illegal activity.

Crocodile hunting
Crocodiles are caught in small numbers in the marsh, but it is prohibited to hunt them. Cats are used for bait. Pieces of a cat are fastened to a metal trident with barbed hooks that is attached to a rope. A large crocodile will fetch Rs. 4,800. The meat is sold for the price of 100 rupees per kilogram. From the crocodile skins, shoes and other items are made. Crocodile hunters sell the skins to a company in a nearby town.

Kasipu, grey label
Alcoholism is a serious problem in Sri Lanka (see also Chapter 11). *Kasipu* is the generic term for illegally brewed alcohol. It is bought by poor people who cannot afford the legally manufactured alcoholic drinks. There are about four *kasipu* breweries hidden in the marsh. Lest the smoke will raise suspicion, the brewing of *kasipu* is done at night or at dinner-time when people are cooking. The *kasipu* is usually sold within a day because demand exceeds the supply. Normally, a barrel will fetch over 2,000 rupees profit, but sometimes the police confiscate barrels. *Kasipu* transports are regularly intercepted and the transporters fined.

[16] Traditional dress for women in many Asian countries.

Kasipu brewing

A barrel containing sugar, fruit, yeast and water, is sunk in the marsh to let the contents ferment. After five or six days, the barrel is taken out of the water, put on stones and heated over a fire. The barrel is partly surrounded by metal sheets to make maximum use of the heat. When the mixture boils, the alcohol starts to evaporate. The fumes are led through a copper extension on top of the barrel. The extension is fixed to a rubber tube, which is connected to a plaited copper pipe. The copper pipes are led through the marsh water for cooling down the liquid and have it condensed into alcohol. The produce of one barrel is about 40-litres of alcohol, which is mixed with 60 litres of boiled water. The *kasipu* is sold for 30 rupees per litre.

The preparation of *kasipu* is subject to change. Not all brewers stick to safe ingredients and experiment with cheaper substances, such as fertiliser and even urine, sometimes with fatal results for consumers.

9.6 Coping with 'evil liquids'

For the people there are two kinds of so-called evil liquids, namely: alcohol and floodwater.

Alcoholism
Most of the interviewees (89%) felt that alcoholism was a problem in the area. Forty-two percent of the respondents said that alcoholism was a problem, believing that tiredness was the main reason for drinking *kasipu*. The psychological stress of being poor was meant here rather than physical tiredness. "To forget problems" was mentioned by 31 percent. "It is a habit and people are addicted to alcohol", was also mentioned a few times. The case below makes it clear that while the men are drinking their problems away, the problems for the women in the wetland with an alcoholic spouse are aggravated.

Boggy dipsomaniacs

Susila is a young woman who lives in a small wooden house in the marsh. Her husband is an alcoholic and pays regular visits to a *kasipu* bar. In general the situation here has improved, she says, but alcoholism has worsened. The bar in the village is open from 11a.m. to 3p.m. and from 6p.m. to 11p.m. Sometimes there are as many as 20 men in the small bar. "My husband can hardly wait till it is drinking time. Almost all men drink in this village and many die. They drink because they are frustrated from being poor. The drunken men fight with their wives and scream bad words and some even smash the TV. They also bother young girls, which makes it unsafe for them to move around. In Sri Lanka, we used to respect men a lot, but when they start drinking and behave badly, we look down on them. Some women also drink, but stay at home. As more and more people come, the problem will increase. The government should control it better."

Floods
Two or three times a year the wetland is seriously flooded. If this happens, the water level in some of the dwellings rises up to 50 centimetres and the floors of many houses remain submerged for more than a week.


Monaco village, after a flood.

Despite the health hazards and the logistical problems caused by floods, the illegal settlers stay in the marsh. According to the majority of the people surveyed (54%), heavy rains and floods create a stressful situation in the household. However, there were strong differences between the inhabitants from the lagoon, the marsh, and the resettlement village Awarakatuwa. The breakdown is given in Table 9.9.

Table 9.9 Floods perceived as stressful

Area	**People who perceive floods as stressful (n)**	**People who perceive floods as not stressful (n)**
Lagoon	8	22
Marsh	45	4
Resettlement area	1	19

Source: Livelihood household survey.

The main problem for households is that the house gets flooded during heavy rainfall (41%), which creates difficulties for cooking (23%), or makes cooking impossible (29%). The inability to go to work or school was also felt as a serious problem, and some people try to arrange transport over water during the inundations. Six people said that the houses are subject to damage during floods and five said that reptiles such as snakes come swimming into their house. The case below illustrates how people cope with their livelihood during the inundations and how floods jeopardise people's health. The case also illustrates the kind of assistance that is provided by social institutions.

High waters, low income

Marina points out the waterline in her house caused by the floods from a month ago. The line is almost one meter above the floor. The floodwater had been contaminated with excrement from humans and pigs, which left her with boils on her feet. She

herself suggested that the boils were due to chronic gout. They lived on the bed and could not go shopping. The Urban Council had once brought them a food package by boat. When the water had risen further, they had tied some household items to the wall and waded through the water to the church where they remained until the water level had receded. The church provided meals, she says, but you have to bring your own sleeping mat. Her husband had not been able to do any work. He worked only two weeks per month as a fisherman because of the rain. Sometimes they go out fishing in the lagoon with three other people but the catch is often so small that there is no profit. If they had money, she would like to move out of this place.

Almost half of the respondents (42%) take precautions against flooding. Piling up of household items on top of furniture is done in 32 households, and 27 families said they would leave the house and stay in the church, school, or with relatives until the floods recede. Two respondents bring their children to relatives but stay in the flooded house themselves. Thirty-six respondents answered that their family ate less during floods due to difficulties with cooking. For some, the transport problem is also a cause for eating less during floods. The main reason for the 63 respondents who said not to eat less was that many institutes or relatives provide food during floods.

Food items or packages are the common aid goods given to people affected by the floods. Some respondents complain that assistance from certain organisations is only given to the political or religious followers of the organisation concerned. Some households receive a daily lunch package from relatives, and others are given dried food rations from an organisation. A standard package contains sugar, milk, curry, dhal, dried fish and potato. Sometimes family members assist by giving money or by providing material to improve the roof and the house of the victim. They also provide emotional support.

Table 9.10 Assistance provided to households in difficulty

Assistance given by:	**Households**
No assistance	33
Local government (*Grama Niladari)*	46
Urban Council	40
Church	21
Family	20
Friends or neighbours	17
NGO	6

Source: Livelihood household survey.

9.7 Conclusions

This chapter dealt with the ways in which households in Muthurajawela generate a livelihood and with the constraints they face in maximising their resources. The research questions that this chapter attempts to answer are: *What resources and assets do the wetland households have and how are accessibility and accumulation of these constrained by the characteristics of the environment? And: What strategies do people use to overcome these constraints in their generation of livelihood?*

For most of the wetland inhabitants, houses cannot be considered durable assets. The poor in Muthurajawela have constructed a dwelling in the conservation zone in order to have a cheap place to live. Encroachment is an essential part of their livelihood strategies. However, as illegal residents, the settlers face many problems. Some have managed to improve their huts into reasonable dwellings built on a physically strong foundations. The 'owners', however, are always aware of the fact that their homes, since they are built on illegal sites, only have personal survival value for the time they will live there. They know that improving their houses can never be regarded as an economic investment. Their dwellings are not assets that can be converted into money.

In the wetland, a common strategy for the people who want to improve their house is to buy only some building materials just to make a start. In that way, they are not tempted to spend the money on other things and they will not find themselves in an awkward situation when relatives appeal for financial assistance. It can take a few years before the improvement is completed and some households never manage to reach that stage. A foundation of a newly-planned house can lay idle for years, overgrown with weeds, without the building progressing any further.[17]

Most wetland people use coping strategies to deal with the odds in their environment in a more or less strategic manner. These coping strategies have a relatively short-time perspective, like going on tick and paying later. Frequent visits to pawn shops take place in order to exchange gold into money and maybe, if possible, to buy the item back at a later stage. When a household needs cash, jewellery is usually the first asset to be converted into money. Jewellery is easy to keep and to move. Pawn shops are most frequently used to obtain money. There are many of them around the wetland. As ornaments are mainly worn by women, it gives women a greater control over the golden valuables compared to other expensive items in the household such as a TV or a bicycle. Golden items are small, keep their value and they are one of the most important assets in the wetland household. The problem is that many women are in the situation of running out of gold.

It seems that the people in the lagoon area rely more on coping than the marsh people do. The average household income in the lagoon area is lower than in the marsh area. In spite of this, the households in the lagoon area have more savings. The fact that the lagoon people are more dependent on coping than the marsh people could have something to do with the higher population pressure in the lagoon area. There, household size is larger and house density is higher. The lagoon area is much more congested than the marsh area. The people in the marsh experience their environment as more peaceful and less disease-prone than the people on the lagoon islands. There were no major differences how people experience their environment between the marsh people proper and those of the inhabitants of the resettlement village in the southern part of the wetland, except in relation to floods. Many people try to find a job abroad to improve their livelihood and that of their family without having the necessary papers, sometimes even with false documents. Others are engaged in illegal activities in the wetland in order to save or earn money or fish in territorial waters of other countries.

About one in four households receives food stamps in Sri Lanka. Numbers of food stamp beneficiaries often have been used as indicators in identifying groups most affected by poverty, and where problems of child survival and development exist to a greater degree than elsewhere (UNICEF 1991). Whilst it is comforting to learn that poverty alleviation is

[17] In this research, the larger and richer looking houses in the lagoon were excluded from the survey, leaving only the poor people in the lagoon area (see Chapter 5).

receiving attention from the government, the danger is that some people have the idea that assistance such as Samurdhi is a benefit that they can expect to enjoy for life. To avoid discouraging people from working, evaluation of the scheme should show what percentage of recipients do not need it anymore as a result of improved circumstances. Credit and 'instant' loans for consumption are of particular importance for poor people like the wetland dwellers. It enables them to meet social and other obligations without having to resort to a moneylender or pawn shop for the sale of scarce assets. It is clear that the number of aspiring Tikiri kids benefiting from the exiting gifts provided by the Seylan Bank are limited in the wetland. While the development work carried out by institutions such as SANASA, the church and NGOs is praiseworthy, the effect of such development activities can have a negative impact on the ecosystem. Some of the non-integrated activities for the poor encroachers, such as the establishment of Monaco village in the lagoon, have undermined the lagoon fishery. The cost of this development has to be borne by another group of poor people, namely the lagoon fishermen.

The poor in the wetland try to improve their standard of living against many odds. Two of those odds, floods and alcoholism, play a crucial role in the lives of the inhabitants. Whereas floods are accepted as a natural phenomenon or an act of God that has a temporary nature, alcoholism is seen as a self-inflicted situation. Alcohol is seen as the number one enemy of the poor that can cause their household plunge in a downward spiral. More than any disease occurring in the marsh and no matter how high the flood, it is *kasipu*, cheap and easily available, that brings disgrace and bitter poverty on a family and often leads to death.

10 Wetland Women and Livelihood

"*In this Countrey each Man, even the greatest, hath but one Wife; but a Woman often has two Husbands. For it is lawful and common with them for two Brothers to keep house together with one Wife, and the Children do acknowledge and call both Fathers"* (Knox 1681: 135).

"The natives of Ceylon are more continent with respect to women, than the other Asiatic nations; and their women are treated with much more attention. A Ceylonese woman almost never experiences the treatment of a slave, but is looked upon by her husband, more after the European manner, as a wife and a companion" (Percival 1803, in Baker 1998: 123).

Elderly woman weaving *cadjan* mats.

10.1 Introduction

Without pretending this study to be a gender study, an attempt has been made to give a description of the position and roles of women in Muthurajawela. Information about women in relation to livelihood and health is discussed in the following chapters as well. Below, some information about women in Sri Lanka in general is presented, followed by sections on livelihood, employment abroad, and reproductive health.

According to some people, the comparatively equal situation of men and women in Sri Lanka can be traced back to Buddhist tradition. Women participated in the religious world till the 11th century AD, but even before that, they had important positions in warfare and science (Risseeuw 1988). Although the prominent position of women underwent substantial changes over time, their status is still higher than in many other developing countries. This chapter was written one day after Mrs. Sirimavo Bandaranaike died at the age of 84. She was the first elected female prime minister in the world, and her daughter, Mrs. Chandrika Bandaranaike Kumaratunga, took office as the fourth elected female president in 1994. At the Sydney Olympics in 2000, a Sri Lankan woman won a medal for the 200 meter track event 52 years after the last Olympic medal was won by Sri Lanka. Finally, I have to mention Sri Lankan's first female pilot, Anusha Mohamed, who qualified as first officer at Sri Lankan Airlines at the age of 24 in October 2000, and the architect Nela de Zoysa. While the world of architecture is still male dominated, she was the first Sri Lankan to be awarded the international ARCASIA Gold Medal for Excellence in Architecture (1999).

However, in spite of the good records of women in politics, education, sports, and art, the lives of women are influenced by problems like poverty, environmental problems, and an increase of refugee population. These circumstances push women into jobs with meagre wages and very little benefits.

10.2 Livelihood and female household heads in Muthurajawela

Mahanama's survey group found that 30 percent of the women in the marsh area in the age category of 14 to 30 years were without employment, while the male unemployment in this age group was 17 percent. Some of the women who live in the wetland work in the free trade zone. They complain about the work situation. Although their salaries have increased, the women work for long hours and often suffer from intimidation, including sexual harassment. They come home late, which causes tension in the family. Problems adding to the prevailing frustration in poor households are the excessive use of alcohol and physical abuse by men. Many women in the wetland decide to find a job abroad.

Assets

We have seen in Chapter 9 that jewellery is an important household asset for as long as a woman or the household has it in possession. In practice, the items of gold are often sold to the jewellery shop or pawned with no intention to buy it back. The money received for the gold is often spent or invested into another asset. Most of the time the money is used for improving or enlarging the house.

Saleswoman without a shop.

Female-headed households

Ten out of the hundred households visited in the livelihood survey were female-headed. According to the Asian Development Bank, in Sri Lanka, especially in the eastern districts, the rate of female-headed households is far higher, due to the impact on women of the civil war (IRMP 1999). The male heads in the livelihood household survey had slightly more education on average (7.0 years) than the female heads (6.5 years), but this difference was not significant.

Saving

Of the ten female household heads, only four had saved some money. The female-headed households on average had saved Rs. 2,385, while the average saving for male-headed households was Rs. 3,829. Sometimes saving was possible because a child of these low-income families had received money from an organisation, or elder children were able to put some money aside from the income they earned. Table 10.1 shows the percentage of men and women who were able to save money. Of the 75 household members (of a total of 472) who saved some money, 37 were men and 38 were women. Overall, the amount of money saved by the female household members was more than the savings of the male members.

Table 10.1 Savings by gender

Savings of household members	Men	Women
Rs. 100 – 1,200	36%	32%
Rs. 1300 – 20,000	13%	19%
Total	49%	51%

Source: Livelihood household survey.

Male household heads claim ownership over female goods. Female household heads and spouses of male households have fewer assets than male heads of households. Whereas 60 male heads owned jewellery, only four female-headed households had jewellery and two female spouses owned items of gold.

The average income of the ten female heads in the livelihood survey was about six times lower than that of the male heads. Only three female household heads had a job, as coolie, trader, and tailor respectively. Sometimes, a widowed mother is the head of the household and the younger, more active women in the household earned money for the family. Many families have a member, usually a woman, who is involved in some sort of income-generating activity, such as the home production of goods for a nearby factory, or jobs organised by or through an NGO.

10.3 Employment overseas

A considerable number of households in the wetland have a member who is or has been working abroad. Sri Lankan expatriate workers represent a major source of foreign exchange earnings to the nation. Overseas workers are mainly women who work as a domestic servant in countries in the Middle East. However, in the last few years the lucrative employment opportunities are also offered to Sri Lankans by several other countries, such as Cyprus, Singapore, Malaysia, Seychelles, and Hong Kong. The poor situation in which many women in the wetland find themselves, and the attractive packages offered by certain foreign organisations, are reasons for many to apply for vacancies overseas. Cyprus in particular is popular among the employment seekers because the salaries are comparatively high and harassment by employers low. As said before, private remittances of expatriate workers are an important source of income for Sri Lanka. However, the cases below show that working abroad does not always improve the situation of the women involved.

Sepalika in Bahrain

Sepalika is 29 and lives with her parents in the marsh. When she was employed in Bahrain, she had to work long days, starting at five thirty in the morning and often till midnight. She had to do the household chores, prepare all the meals for the family and also had to take care of the young children. Sometimes they beat her when she could not finish the work in time. In her letters, she asked her mother to pray to God that her madam would not overload her with too many household duties. Because her boss confiscated her passport, she could not go anywhere, and the Sri Lankan embassy had to deal with many more urgent matters, including women who had been raped. After she threatened the family to go on a hunger strike, she was given a return ticket.

Nipani in Malaysia

Nipani lives with her mother in the resettlement village of Awarakatuwa. She speaks English fluently, which she had learned in Dubai and Malaysia during her stay. She helped her family by sending money home and her mother was able to complete the building of a concrete house. When she was working in Malaysia, she went to Sri Lanka for holidays. Meanwhile, a Sri Lankan colleague of her who was also working in Malaysia had told Nipani's employer that Nipani had spied for her husband's business. This lie enabled a relative of the Sri Lankan colleague to apply for Nipani's job. Nipani had received a letter from her madam in which she wrote that she needed somebody for part-time and that Nipani could send back the ticket, as she would not need it anymore. In the meantime the money she had earned is spent and Nipani is now looking for a job in Italy. She knows a few people working there who had told her that the salaries are high and the Italians friendly. One problem is that for countries where the salaries are higher, the foreign employment offices charge more money for the passage.

Many of the housemaids who work overseas come back with jewellery and loads of electrical household appliances. Usually they have sent money home regularly to their families and relatives. According to the Foreign Employment Bureau, Sri Lanka's earnings from remittances of expatriate workers in 1999 amounted to more than one billion US dollars. A total of 105,000 foreign jobs were held by Sri Lankans during the first seven months of 1999, which was more than the same period in 1998 (Daily News March 2000).

Some of the women who worked overseas suffer from nightmares caused by negative experiences. However, very often problems arise at home with the family, such as problems with the children who stay behind or the husband who cannot cope with the situation.

Anusha in Saudi Arabia

Anusha's husband left her for another woman when she lived abroad with her two children. She is very sad when she tells the story in her small empty house in Siri-wardene, one of the lagoon islands. She has been working in Saudi Arabia for two years and had been sending money home as well as various valuable household items. When she and her children came back, her husband had taken everything, including the money she had sent home. She has nothing, not even a television-set. Now she plans to go abroad again if she cannot find a proper job here. She will send the children to a children's home but before she goes she wants to make sure that the children are fine, as she will only see them at Christmas. Presently, her brother gives her 150 rupees a day.

Dathani in Jordan

Dathani came back from Amman after being mistreated by her employers. After half a year they had stopped paying her salary and when she had asked for it, she was told that she had to be happy with the food and the room offered to her. She went back to Sri Lanka with only little money. She lives alone in a simple *cadjan* construction in the marsh because she is too ashamed to go back to her family in Puttalam. "They will be very angry with me for not bringing anything back from Jordan. They will never believe my story and say that I have spent all the money myself".

The cases above show that the stress and strains of working abroad can cause anxiety, depression and loss of self-respect among women. Men, in the absence of their wife, are inclined to alcohol abuse and often develop psychological problems. In combination with poverty and unemployment, such conditions could lead to suicide. Suicide rates are quite high in Sri Lanka.

10.4 Wetland women as mothers

When a woman in the wetland is pregnant, she will usually go to an antenatal clinic. How often she will go there depends on the distance, attitude of the staff, and whether it is her first child. Children are usually born in the hospital and the mother and child will normally stay there for about three days. It is often the mother of the woman in labour who is assisting her daughter and will stay with her some time after the birth of the child. Helping her with bathing, washing clothes, cooking and taking care of the baby. The father does not attend the birth unless the baby is born at home accidentally. He may help doing household chores and do some shopping.

Almost half of the women interviewed considered two children to be the ideal number. Thirty percent said that having three children would be best and twenty percent thought four or five would be ideal. Five women said that having one child only would be enough. The main reason for having only a few children was an economical one, as is illustrated by the case below.

Kusum about having kids

> Kusum, who is 30 years old, has ten years of schooling and is married. She has three daughters and does not want any more children. Two would have been ideal, she says, because they are poor and do not have enough money to support a large family. If she were rich she would like to have four children because then there will always be someone to look after you when you get sick. She is concerned about their illegal status in the wetland. "This is government land and nowadays no more permissions are issued to live here." According to Kusum, the ideal spacing time between the births of two children is four to five years. She did not sleep with her husband for four months after giving birth, in order to recover from the delivery. She is still breast-feeding her youngest daughter of two. If her daughter became pregnant at the age of 15, she would send her to a clinic for an abortion. "Fifteen is too young to become a mother." Abortions, although officially illegal, are free, she says. There is no money involved. She knows about modern family planning methods and she herself uses injections every three months as contraception. She knows about other methods, but has never seen a condom.

Generally, the use of contraceptives is discussed with the husband. One woman said that her husband was scared making her pregnant when using the calendar method and wanted his wife to get injections, whereas she preferred the calendar method and was scared that the Depo-Provera injections (brand name) would have side effects. Another woman who did not use any family planning method, had asked her husband to do something about it, meaning sterilisation (vasectomy), but he had shown no interest.

More than half of the women interviewed in the 'survival survey' were using, or had ever used a modern form of contraceptives. A third used a traditional method to avoid pregnancies.

Sixteen percent of the respondents had never used a contraceptive method. Sterilisation and Depo-Provera injections are the most popular modern methods. Thirty-five percent of the respondents were sterilised because they considered their family to be complete. Less then ten percent used or had used the pill or an intra-uterine device (IUD). The calendar method was the major traditional way to plan the number of children. Many women who had undergone a sterilisation had used the calendar method or a modern contraceptive prior to the surgery. Two husbands of the respondents had undergone a vasectomy.

There are family planning clinics in Sri Lanka and family health workers pay visits to households in order to inform women about family planning methods. Mother and child health (MCH) sections in hospitals also deal with family planning. The Roman Catholic Church, which otherwise has a lot of influence in the wetland area, is, as might be expected, not supportive of modern family planning. According to 75 percent of the women the church gives family education and does not advocate large families. Eighteen percent of the women said that the Roman Catholic Church is not in favour of modern family planning methods.

10.5 Conclusions

This chapter dealt with gender issues in relation to livelihood and reproduction. The specific research question was: *What is the role of gender in ownership, access and use of resources and assets?* In this section, the conclusions regarding this research question are presented. Chapter 14 presents a more general discussion on gender in relation to livelihood, health and the environment.

Jewellery is the most common asset found in the households studied, although the wetland dwellers do not have many assets in the first place. It is customary for girls and young women to have jewellery, but generally household assets are considered to belong to the male household head. When a woman in the wetland gets married, ownership of gold assets tends to become somewhat vague. When she has received the jewellery from her husband, they are more his than hers. Although it is the wife who wears the jewellery, it is usually owned by the head of the household. In case of divorce, it depends on the character of the husband and the family situation whether the woman can keep the items. Second on the list of valuable household assets are a radio and/or a television set. Television sets are highly valued. A television set is often the first thing people wish to have.

During the period 1998 - 2002, the Integrated Resources Management Program served as a facilitator and a linking agent between the mainly female producers of diverse products and the market. Chapter 13 shows to what extent these activities benefited the women involved in the income-generating program. Many women seek employment outside the borders of the wetland to survive. They find work in the free trade zone or other nearby institutions or they go abroad. They have to face many uncertainties, especially when they work abroad and leave their family behind. Once the women, and also their family, are used to the income from overseas, a second foreign contract is quickly signed. However, a number of women have negative overseas experiences and try to find employment closer at home in Muthurajawela.

Sri Lankans tend to refer to their culture as an excuse not to address sexual issues. Some mothers were reluctant to speak about matters related to sex out of embarrassment. Many teenagers who are experimenting with sex are not aware of the consequences and may end up being in trouble. Once an unmarried woman becomes pregnant she alone is blamed for engaging in sexual activities, not the partner. As a result of the unwanted pregnancy she alone

has to undergo all the physical and mental suffering that ensues. An abortion cannot be performed legally in Sri Lanka, not even for cases of rape or incest, while rape is not uncommon. It is only done in cases where the doctors certify that the mother's life is in danger. Nevertheless, many abortions are performed illegally in Sri Lanka, according to the director of the Women's Bureau. A lot of young women experience unwanted and risky pregnancies or suffer the misery and pain of an unsafe and illegal abortion.

According to UNICEF (MPPI 1993), just over 70 percent of mothers nation-wide have at some time used a form of contraception, which included both modern and traditional methods. The Muthurajawela sample represents this average figure, although the use of modern methods in the wetland is probably higher. Women in Sabaragamuva province were more likely to have ever used a form of contraception (87%). In contrast, mothers in the central and southern provinces were less likely to have ever used contraception (57 and 55% respectively). These figures, however, date from seven years prior to this research. With the increasing violence against women as in Padma's case, and other forms of sexual abuse, women continue to suffer from unwanted pregnancies. Therefore it is not surprising that in the wetland, or in Sri Lanka in general, contraceptive prevalence is high. However, family planning methods are supposed to be available only for married couples. Unmarried persons are not expected to be involved in sexual relations, let alone possess or use contraceptives. After experiencing an unwanted pregnancy or hearing about the unfortunate plight of others, it is understandable that the majority of the women are relieved to be able to use contraceptives without shame once they are married.

11 Etic Views on Health, Disease and Cure in the Wetland

This chapter presents the etic approach, or the scientific and outsider's views, on health and disease in the wetland environment. To begin with, a marsh with stagnant water is not a healthy place to live in. In the western cultural tradition, wetlands have been associated primarily with diseases and death. Malaria for example (literally 'bad air') was thought to be transmitted by damp from boggy grounds. It was often the smell of rotting vegetation in the swamp that was associated with disease. The typical response to the threats posed by wetlands was to reclaim them. Rod Giblett in his book "Post-modern wetlands" (1996) refers to historical novels in which the horrors of marshes are described.

> *"It was a nightmare time of filth and sludge and stench. Be as careful as they would, the all-pervading mud spread by degrees over everything in and upon the boat, upon themselves, everywhere, and with it came its sickening stench. It was a place of twilight, where everything had to be looked at twice to make sure what it was, so that, as every step might disturb a snake whose bite would be death, their floundering in the mud were of necessity cautious. Worse than anything else it was a place of malaria"* (from the novel 'The African Queen', cited in Giblett 1996: 104).

Marshes are neither land nor exclusively water but something in-between. To outsiders, this ambiguous character of wetlands (land and water, gas and liquid, light and dark) was felt as threatening rather than as fascinating. Wetlands were seen as places infested with malaria, a place where reptiles and other monsters were lurking. Malaria and miasma (gas and water) were perceived as polluting the air, bad infectious air that comes up from the black waters.

11.1 Marsh-related diseases, health status and public health issues

To estimate the incidence of a number of diseases in the wetland of Muthurajawela, data were collected from three hospitals in the area for the years 1997 to 2000. These were the Government Base Hospital at Negombo, Ja-Ela Hospital, and the Government Teaching Hospital at Ragama. When the relatively small hospital of Ja-Ela moved to another location in 1999, information on the incidence of alcoholic liver disease was lost. At the new location, no more laboratory tests to diagnose Japanese encephalitis, dengue and leptospirosis were carried out in Ja-Ela hospital. Patients with clinical signs for one of these diseases were referred to Negombo or Ragama (Table 11.1 and Appendix 7). The small Peripheral Unit (PU) at Pamunagama, a village situated in the wetland, refers most of the patients with infectious diseases to the hospital in Ragama. The health personnel at the PU diagnose most of the diseases according to the clinical signs and symptoms. The figures on infectious diseases presented in Table 11.1 are for the area as a whole. Data collected on alcohol-related liver diseases are discussed separately.

Table 11.1 Number of admissions for infectious diseases to the hospitals in the Muthurajawela area

Diseases	Total 1997	Total 1998	Total 1999	Total 2000
Malaria	667	255	344	558
Dengue + D.haemorrh. fever	11	10	122	632
Japanese Encephalitis	4	5	11	15
Leptospirosis	16	37	162	253
Diarrhoea	1942	1845	2185	2128

Source: hospital statistics.

It must be noted that the table above does not include figures from the out-patient department (OPD), so the actual number for most diseases is probably much higher. Many patients will just be treated at the OPD for their symptoms. Filariasis, a common disease on the west-coast of Sri Lanka, is not included in the table, as the patients suffering from this worm infection usually get a prescription at the OPD to treat this disease at home.

Malaria

Robert Knox (1681), who was taken prisoner in Ceylon in 1660, does not mention malaria in his book "A Historical Relation of Ceylon". After the British had gained control over the island, a large number of references were made to an illness that, most probably, would have been malaria. There were reports about a very serious epidemic in 1803. The first report on malaria from Sri Lanka is found in an administrative report of the civil medical department in 1867. It was a time when the only anti-malarial drug in use was quinine (Uragoda in Konradsen et al. 2000).

At the beginning of the 20th century, at least ten major epidemics occurred in the country. The most serious one was the 1934-1935 epidemic with more than five million patients and over 80,000 deaths (Edirisinghe in Konradsen et al. 2000). Malaria played an important role in World War II and the British Army took extreme measures to keep this disease under control in the country. All ranks had to use repellents and sleep under mosquito nets. Mosquito breeding areas were drained or sprayed with oil. A DDT-based residual-spraying program was initiated in 1945 and malaria morbidity and mortality declined steadily. Because of the discontinuation and weakening of the vector control program a resurgence of malaria resulted in a massive epidemic in 1968 (Nájera et al. in Konradsen et al. 2000).

A limited health study of the people living in Muthurajawela marsh, carried out by the Medical Research Institute (MRI) in 1991, demonstrated that malaria did exist in Muthurajawela wetland, although it did not appear to be a major public health problem. The majority of the cases would probably have been infected elsewhere. Personnel from the Anti-Malaria Campaign in the area stated that some of the patients that were treated by them had never been out of the wetland. They warned that if there were to be an increase in parasitic and vector density, it could build up to epidemic proportions. In normal years, there is no malaria transmission in the wider Colombo area, according to malaria experts.

Dengue

Dengue is caused by a virus from the group to which the virus causing Japanese encephalitis also belongs. The disease is transmitted mainly through bites of the *Aedes aegypti* mosquito (Wilcocks and Manson-Bahr 1972).This mosquito prefers to breed in small, often man-made water reservoirs, both out and indoors. Discarded coconut shells, old tires and flower pots are some examples of their habitats. The mosquitoes bite around dawn and dusk. After five to eight days the patient gets fever, headache and pain behind the eyes followed by severe muscle and joint pain and swellings of the glands in the neck. There is often a rash that starts at the trunk of the body and spreads to the limbs and face. Recovery can take a few weeks to a month. There is no treatment available for dengue. The main preventive measure is to avoid mosquito bites and to remove possible breeding places in and around the house. Dengue hemorrhagic fever is a serious complication of dengue. Spontaneous bleedings occur from nose, gums, and the skin. Internal bleedings can cause serious loss of blood. People build up immunity after a dengue attack, but the problem is that there are four different types of dengue viruses (Peters and Gilles 1997). The MRI survey of 1992 described the presence of

dengue infection in Muthurajawela. The entomological survey, which was part of that study, showed that *Aedes albopictus* and *Aedes aegypti* were breeding in most of the container habitats, such as coconut shells and car tyres filled with rainwater.

Japanese encephalitis (JE)
JE appeared for the first time in Japan, but is now prevalent in many other Asian countries. Since 1980, it is also a problem in Sri Lanka with epidemics in 1985 and 1987, in the districts of Anuradhapura, Pollonaruwa and Puttalam. The viral disease is transmitted by mosquitoes that breed in surface water like flooded rice fields. The virus is passed through a host, which are mainly pigs but also aquatic birds (Peters and Gilles 1997).


Pigs are the main spreaders of JE.

Man is a dead-end host and an accidental victim, as the mosquitoes seem to prefer animals. Animals do not get sick from the rapidly developing virus in their body. The incubation period of JE in humans is 6-8 days. The disease can be very serious with high fever, headache, neck stiffness, dizziness, and paralysis, often resulting in permanent brain damage (Wilcocks and Manson-Bahr 1972). The policy in Sri Lanka is to vaccinate children between the ages of one and ten, but only in risk areas such as Puttalam, Gampaha and Anuradhapura District. Muthurajawela is part of the Gampaha District. There is a reliable and safe vaccine available. In 1996 there were 306 cases of JE in Sri Lanka with 44 deaths. There were many more people infected than the number of disease cases reported. The information of the MRI study on JE in Muthurajawela was not very specific but the surveys performed in the area "clearly indicate much JE activity".

Filariasis
Filariasis is a worm infection transmitted by mosquitoes. There are different types of filariasis in Sri Lanka. An infection with lymphatic filariasis can cause fever, pain and swelling of lymph glands and skin rashes. The adult worms that nestle in the lymphatic vessels cause obstruction and inflammation resulting in elephantiasis after many years. After mating, the worms remain in the glands where the females develop eggs and larvae, which they release as micro-filaria into the peripheral blood circulation. The micro-filaria reaches a maximal density at night. This is the reason that blood tests for the disease have to be performed after 10 p.m., unless the blood test is done on anti-bodies. Treatment is with drugs that are available in Sri Lanka.

In old-time Ceylon, elephantiasis of the legs was known as 'Galle legs'. Galle is a town on the South-west coast of Sri Lanka. The distribution of this disease in Sri Lanka is no longer

limited to Galle; infection takes place at the southern and western coastal regions. Muthurajawela lies in the endemic belt of filariasis. According to the MRI report, the vectors of the disease breed in polluted water in the marsh and rest in human dwellings. Five percent of the mosquitoes collected by MRI contained infective larvae. The number of people infected with filariasis in the area was 69 during the period 1981-1990. According to the hospital records, in 1997, five patients suffering from the disease were admitted in the hospitals near Muthurajawela. As said, most of the patients with filaria receive treatment at the OPD. In 1999, the Ministry of Health embarked on a project to eradicate filariasis from the island by implementing the 'single dose mass treatment campaign' on the recommendation of the WHO.

Leptospirosis

Leptospirosis is an infectious disease caused by the leptospira bacteria. The bacteria are transmitted to human beings through the urine of rats. In Sri Lanka, people who wade through water in abandoned gem pits or marshy lands, are liable to get infected. After an incubation period of 1-3 weeks the clinical features may be fever (with or without chills and rigors), severe headache, muscle pains, diarrhoea, and redness and irritation of the eyes. In the more severe cases, the liver and the kidneys will be affected. Treatment is with antibiotics, but the disease can be fatal.

One of the earliest epidemics of leptospirosis (or Muthurajawela fever as it is sometimes called by the marsh inhabitants) was in 1973 when many persons were involved in the widening and deepening of a canal. Some individuals developed clinical symptoms and jaundice. Of the 391 blood samples examined at the MRI, 196 were serological positive and two were culture-positive. Other epidemics occurred in 1986 and 1987. In 1989, wet-rice cultivators who had taken part in clearing canals and had been standing in water for a long time, developed symptoms of leptospirosis. They also had blisters on their feet and legs. Of the 69 blood samples taken by the MRI in that year, 27 were positive.

Diarrhoeal diseases in the wetland

The following diarrhoeal diseases are prevalent in the wetland:

- *Cholera*, an acute watery diarrhoea, was declining in the country after the peak of 1973. Another outbreak occurred in 1998, which also affected Muthurajawela.
- *Amoebic dysentery*, which produces diarrhoea with blood and mucous, is rarely fatal. The MRI found 83 cases over the period 1981-1987 from the peripheral unit (PU) at Pamunugama, with an average of about 14 cases per year.
- *Shigellosis* is caused by the shigella bacteria and is indicated by diarrhoea with blood and mucous. Combined statistics from the regional hospitals show that there were 855 cases for the year 1989. The PU at Pamunugama does not record shigellosis.
- *Enteric fever* (typhoid) is caused by salmonella bacteria. It is spread by consumption of contaminated water and food. It appears as a continued fever that can be fatal if untreated. Hospital statistics show that there have been an average of 114 cases per year in the area in the period 1985-1990 (MRI 1992).
- *Giardia lamblia,* an intestinal parasite, is not recorded in the medical statistics of the three hospitals. However, MRI surveys indicate that it occurs in all areas surveyed in Muthurajawela.

Alcoholic liver disease

Alcohol consumption is on the increase in Asia, Africa and Latin America. One of the reasons is a growing import of hard liquor as well as beer into the countries of these regions. It is

estimated that 5-10 percent of all hospital admissions in Sri Lanka are alcohol-related (Gernaat 2000). A two-year follow-up study of 234 alcohol-dependent men, who had failed to improve after a hospital-based intervention, was carried out in Sri Lanka. The men were admitted to a six-week residential rehabilitation program taking place in a special unit. During an extended period of follow-up, a significant correlation was observed between the ability to abstain from alcohol and having a spouse. Stable family support, higher income and regular employment also helped the alcohol-dependent men to abstain from liquor (De Silva et al. 1992). From the previous chapters it has become clear that the marsh dwellers do not fall in this category. In a follow-up research (De Silva and Ellawala 1994) of the same study group, it was found that the overall mortality was 9.6 percent for a group of 188 men out of the sample population of 234. The 188 men were followed up for at least three years or until death. After the six-week temperance program, 115 men relapsed to heavy drinking. The mortality among this group was five times higher than of those who abstained from alcohol or drank infrequently (2.7%).

Alcohol is associated with a large number of medical, psychiatric and social problems. Hepatitis, liver cirrhosis, malnutrition, and cancers are only some of the medical problems caused by alcohol. Psychiatric complications include alcohol-paranoia, hallucinosis, dementia, delirium, aggressive outbursts during alcohol intoxication, and suicides. Social problems due to alcohol are domestic violence, incest, rape, violent crime, prostitution, thefts, traffic accidents, financial problems, and loss of work. In the marsh there are many problems due to the consumption of mainly illegal brewed alcohol named *kasipu* (see Chapter 9). In the table below, figures are presented on alcoholic liver disease for the area as a whole. No comparison was made between the wetland dwellers and people living in other parts of Sri Lanka, or between patients consuming either *kasipu* or alcohol produced in factories.

Table 11.2 Number of alcoholic liver disease cases admitted to the three hospitals

Alcoholic liver disease / Year	**1997**	**1998**	**1999**	**2000**
Patients	1134	951	1567	2229
Deaths	337	201	168	158
Total	1471	1152	1735	2387

Source: hospital statistics.

11.2 Water and sanitation

Mahanama's team (1998) found that in the marsh area, 88 percent of the households in their study have access to piped water for drinking. The local authorities supply the water from the pipe system for free. Over nine percent of the households obtain drinking water from a well, often located near a church. Twenty percent of the households in the marsh use well water for bathing and washing purposes and about 70 percent use the water of the canals for these purposes.

In the lagoon area, a large number of households depend on piped water. However, the time at which the water is made available has caused many difficulties to the people. Normally, pipe-borne water is supplied between 5-9 a.m., which results in long queues of people at the water outlet. Hence, storage of water has become a necessity. It is common to see a number of plastic containers in or near the houses used for storing water. Still, the amount of water collected is not sufficient and washing and bathing have become a problem. Dangalle's team (1999) surveyed the various sources of water used in the households in the lagoon area the results of which are presented in table 11.3.

Table 11.3 Source of water in Negombo Lagoon area

Source of water	Number of families	Percentage of total
Common tap	540	54.6
Own tap	46	4.7
Common well	235	23.8
Own well	71	7.1
Next door	97	9.8
All sources	989	100

Source: Negombo Lagoon socio-economic survey, 1999.

The table shows that only about 12 percent of the households in the lagoon area have their own water source, and that 88 percent are dependent on other sources, mostly the common tap. People who have their own tap pay an installation fee of Rs. 2,500, and between 50 and 200 rupees per month for the water. This amount is deducted from a prepaid amount. About twice a year, a deposit has to be paid to the water board for this purpose.

Latrine on a high foundation.

Another problem in the wetland is sanitation. In the marsh area about 26 percent of the survey population have a toilet or pit latrine. About 31 percent use a temporary construction, and 43 percent of the households do not have a toilet at all. The members of these households defecate in the marsh (Mahanama 1998). In the Negombo Lagoon area, about 26 percent have no latrine facilities at all, but even among the people who reported having the facility, it was often just a pit protected with *cadjan* or tin sheets (Dangalle 1999). The wetland inhabitants can request the urban council to empty the toilet pit when it is full or when it has been flooded with water. Today, this will cost 400 rupees.

Garbage

The poor encroachers do not produce much household waste and the re-use of bottles, bags, jars and the like is common practice among the dwellers. At some places in the marsh area industrial waste is dumped, such as small pieces of material from garment factories, rubber and plastic, apart from the less visible waste. Some of it is used by the marsh dwellers, for example to stuff a pillow or to make a fence from foam rubber. Some dwellers use the waste and dump it in the marsh to enlarge their yard. The older children of a household also need space to build a dwelling and often do so by reclaiming land in this way.

11.3 Child health

Generally, the birth of a child is not a big event for the poor marsh dwellers. There are no celebrations or announcements and there is no difference in the way baby boys and baby girls are treated. Usually, a child is born in the hospital and the staff will take care of the registration of the child. If the child is born at home, the child has to be registered with the g*rama niladari* (village clerk) in that area. Child mortality is not high in Sri Lanka compared with other Asian countries. Only two children in the households included in the survival survey had died before the age of five in the past eight years. One had died of an infectious disease

and the other baby had suffered too much from the mother's high blood pressure before birth. Most of the children in the wetland households have a growth chart and were getting vaccinations or had already completed their vaccination scheme. Growth-monitoring is not valued as much as immunisation. Few children are being weighed after the age of two. The majority of the mothers return to the mother-and-child health clinic (MCH) when it is time for their child to get another vaccination. Because Muthurajawela is located in an endemic area for Japanese encephalitis (JE), children are vaccinated with the Biken serum for this disease at school.

Marsh girl with golden adornments.

Epidemics such as measles, chicken pox and cholera do occur in the area every now and then. Although worm infections are not considered a serious ailment, children often get a cure for intestinal worms ideally every three months, but many mothers wait for the symptoms of a worm infection to occur.

11.4 Nutrition

On the basis of caloric intake, nearly 25 percent of the Sri Lankan population are below the poverty line. Food-stamp recipients were over 7 million in 1988 according to UNICEF (1991). In Awarakatuwa, in the southern part of the marsh, the number of food-stamp receivers was around 30 percent, while in Kadolle, situated close to the lagoon, almost all households received food stamps (CEA 1994). Personal observations during the household survey in the wetland, did not reveal symptoms of malnutrition. On the contrary, the majority of the children made a healthy and lively impression. Inspection of the growth charts showed that the weight of most of the children was between the lower and upper growth reference lines, but, as said before, the weight checks of the child at the MCH clinic were usually discontinued after the age of two. Wasting[18] (too thin) or stunting[19] (too short) in children could have been present, especially at the age of three, when breastfeeding has stopped.

UNICEF's most recent figures for Sri Lanka show that 25 percent of the infants have a low birth weight and 66 percent of the children were still breastfed at the age of 22 months. The percentage of under-fives suffering from wasting and stunting is 14 and 18 percent respectively (UNICEF 2001). No specific medical information was available about the nutritional status of the inhabitants of the wetland.

A rapid appraisal on nutrition was carried out among 15 families with a child below primary school age. A list with the most important food items and the consumption pattern in the families concerned are presented in table 11.4. In eight households, incomes ranged between 800 to 6,000 rupees per week with an average of 2,125 rupees. For the remaining seven

[18] Wasting: Below minus two standard deviations from median *weight for height* of reference population.
[19] Stunting: Below minus two standard deviation from median *height for age* of reference population.

households incomes were irregular with earnings between 0 - 300 rupees to 0 - 500 rupees a day.

Table 11.4 Frequency of important food items consumed in 15 households

Food item	Once per day	Once per week	Once per month	Once or twice per year	Never
Meat: goat, beef, pork	-	7	3	-	5
Fish	11	4	-	-	-
Poultry	-	7	6	1	1
Liver	-	3	1	2	9
Eggs	2	10	3	-	-
Peas, beans, dhal, nuts	4	11	-	-	-
Leafy vegetables	2	12	1	-	-
Other vegetables,	13	2	-	-	-
Milk, yoghurt, gurd	10	5	-	-	-
Fruits	-	9	5	1	-
Rice, bread, noodles	15	-	-	-	-

Source: Rapid appraisal on nutrition.

If meat is consumed, beef is most popular. Goat and pork are eaten less frequently. Fish is the most frequently consumed protein source, and eaten at least once a week in all 15 households. Chicken liver is eaten along with the rest of the animal and in three households the liver was sometimes only given to children. Nuts are generally not eaten. Lentils and beans are the primary source of vegetable proteins. Consumed with rice, these make a very nutritious meal.

Table 11.5 Twenty-four hour dietary recall

Food item	Children (15)	Mothers (15)	Fathers (4)
Meat (Goat, Beef, Pork)	1	1	1
Fish	9	11	4
Poultry	-	-	-
Liver	-	-	-
Eggs	4	2	1
Peas, beans, dhal, nuts	8	7	2
Green leafy vegetables	5	5	2
Other vegetables,	3	6	2
Milk, yoghurt, gurd	13	8	2
Fruits	5	3	1
Rice, bread, noodles etc.	15	15	4

Source: Rapid appraisal on nutrition.

A 24-hour dietary recall was made for parents and for one child in the family, resulting in 15 recorded dietary recalls for both children and mothers, and four recorded recalls for fathers. Milk and tea are always drunk with sugar, and tea is usually taken with milk. Milk, fruits and eggs were considered especially good for children. Bananas were the fruit most often mentioned in the 24-hour recall, followed by papaya. Children of four and five years old were basically eating the same things as their parents, but in smaller portions. A few children had been given an ice-cream or a toffee. Sometimes biscuits are given to children for breakfast or in-between meals.

11.5 Conclusions

This chapter approached the health situation in the wetland from a scientific or etic perspective. The related research question was: *What are the etic factors that can either cause, contribute to, or protect from sickness in the specific environment of the wetland?*

From this research it appears that alcoholic liver diseases are the most serious health problem in the wetland area of Muthurajawela with a high percentage of fatal cases. In 1999 and 2000, more people were admitted in the hospital with alcohol-related diseases than in the previous two years. However, the death rate of 326 for these two years was far less than the 538 patients who did not leave the hospital alive in the years 1997 and 1998. An person addicted to alcohol is an enormous financial burden and a liability to a poor household. For the people (mostly men) in the wetland, the consumption of alcohol is a way to forget their problems. But once a man starts drinking, his financial and health problems will increase and bring the entire household in a downward spiral. Sri Lanka has some of the highest rates of suicides and traffic accidents in the world (Marecek 1998; Gernaat 2000). It is likely, but not proven, that this is related to alcoholism.

The in-patient records of the three hospitals in the wetland area show strong fluctuations in the incidence of malaria over the past four years. Epidemics of dengue have occurred in Southeast Asia during the last two decades and appear to become more frequent. In the vicinity of Muthurajawela, an increasing number of patients with dengue and dengue hemorrhagic fever were admitted to the three hospitals during 1997-2000. The same can be said for leptospirosis which increased fifteen-fold during this period. The incidence of diarrhoeal diseases remained more or less the same in the area.

Child health care is at a reasonable level for a developing country. UNICEF (1995) states that there is no severe malnutrition of under-fives in Sri Lanka. The World Health Organisation recommends that between four and six months of age, breastfed infants should be given complementary foods. In Sri Lanka, however, close to three out of ten infants over the age of six months are not receiving any complementary foods. This could also be true for Muthurajawela, although no indication was found of undernourished children below the age of two from this study. Whereas in India and other countries in Asia infanticide and neglect of baby girls takes place because sons are preferred, in Sri Lanka, there appeared to be no differences in feeding patterns or treatment between boys and girls.

The average number of households receiving food stamps in the country is one in four, which is about the same as in the southern part of Muthurajawela marsh. The number of food-stamp recipients in the northern part of the marsh, however, is much higher than the national average. According to UNICEF, households who receive food stamps are more likely to eat less than three meals a day. Subsequent research on the subject has revealed that women-headed households are generally excluded from many of the state-sponsored social programs. If this is true, women-headed households with young children are particularly vulnerable. Although the rapid appraisal on nutrition carried out by this study was relatively small, there are no indications that the nutritional status of the people in the wetland in general and of the children in particular, differs from the rest of Sri Lanka.

12 Emic Views on Health, Illness and Healing in the Wetland

In this chapter the people's own perspectives on health and environment in Muthurajawela are described. In this emic view, the ideas of the people about causes of illness are presented and on how, in their view, health and diseases are influenced by their environment. Most of the data in this chapter were collected during the survival survey that was done among 100 women of different households in the wetland. Two traditional healers were interviewed to obtain some information on traditional and ritual healing.

12.1 The good and the bad from the wetland

When walking through an area where floods occur two to three times a year, where pigs run between the houses and rats are abundant and different types of mosquitoes infest the area, one wonders how the people think about living in such a place. Therefore, one of the questions of the survey was: "By living in a wetland, do you think people are more likely to get diseases than if they live outside it?" Remarkably, only 35 women found it to be unhealthy to live in a wetland, while 64 women were of the opinion that it was as safe or even safer to live in the marsh than outside. The majority of the women who thought it was unhealthy living in the wetland were inhabitants from the densely populated lagoon islands. Most of the respondents from the scarcely populated marshy area found it healthier to live here than in the more congested areas around the wetland.

The major nuisances coming from the marsh, as reported by the women, were floods (53) and mosquitoes (42). The salinity of the water was a problem for 28 of the interviewed households, and rats were mentioned 12 times. Generally rats were not seen as disease spreading animals, but more as a household pest because they eat stored food, even from plastic containers. It was said that rats make a lot of noise at night and that they sometimes bite people. Rat bites are cleaned with water and soap or with heated metal. The locals distinguished three types of rodents: the common rat that enters the house and runs over roofs; the *onomia,* which is a rat as big as a cat that stays on the ground, and mice. Eight women mentioned that the marsh was infested with disease. A few women stated that rat urine could cause Muthurajawela fever, the local name for leptospirosis. They said that it did not exist in their area, but that the fever develops in paddy fields. One woman knew that when you were drinking water or eating food which was contaminated by rats you could get fever and die. However, most of the wetland inhabitants had never heard about Muthurajawela fever or leptospirosis and thought the interviewer was referring to yellow fever.

12.2 Health perceptions and illnesses

The women were asked about the two most common illnesses among adults and children in the wetland. The most common illnesses mentioned are presented in Table 12.1.

Table 12.1 Common illnesses in the wetland according to the respondents

Common illnesses	Cough and cold	Fever	Pain in joints	Back pain	Diarrhoea
In adults	32%	26%	33%	10%	
In children	76%	72%			11%

Source: survival survey.

Other illnesses mentioned (six times) in relation to adults were wheezing and chicken pox. Alcoholic ailments were mentioned four times. Thirteen mothers could not mention the most common diseases among adults in the area, and two people said that no particular illness was very common in Muthurajawela. Less common diseases among children, according to seven women, were skin infection such as nodules on the feet (probably caused by hookworm). During the survey, a small outbreak of measles occurred on the lagoon islands, so seven women from that area mentioned measles to be common in children. Wheezing was mentioned four times.

Two questions regarding the knowledge about the aetiology of fever and diarrhoea in Muthurajawela were included in the survival questionnaire. According to 43 women, fever was caused by cold. Twenty women related fever to the floods that inundate the area about twice a year. Nine said that fever could be caused by eating spoiled food or drinking bad water. Four women said that fever is spread from person to person, and four other women said that fever was transmitted by mosquitoes. Fever could happen after taking a bath, especially if it was not a thorough bath. One is supposed to take a full bath involving a certain number of buckets of water. Thirteen respondents had no idea about the cause of fever.

According to 38 women, diarrhoea is caused by consuming spoiled food such as prawns. Drinking bad water was mentioned by 22 respondents. Consuming the green leaves that grow in the marsh, such as water cress (*kankun*), could be dangerous to eat in the rainy season when dirt is spread out by the floods. Five respondents mentioned flies and one person said that diarrhoea is caused by germs. Eleven women had no clue as to what causes diarrhoea, and five stated that diarrhoea is not an issue in the wetland.

12.3 Childcare

Some children will get a fetish around the waist, the wrist, or the neck. This is usually just a string, but sometimes a small bundle of written prayers prepared by a priest is attached to it. It is not, however, a common practice in this predominantly catholic area. Young children often have a dark round mark (*pottuwa)* between the eyes. It was said that this is mainly to avoid people staring in admiration to the cute child, which is considered embarrassing and harmful. With this dot, the attention would be drawn away from the beautiful child and evil influences would be rendered harmless.

According to the mothers in the marsh, it is normal to give a child two to three years of breastfeeding, but the moment at which they start giving solid food to a child is variable. People say that the young child will get the same foods as the adults as soon as possible, but they do not give it chilli's at a very early age. When a child refuses to eat, the mother will respond by trying to feed it with plain rice, biscuits, banana, or eggs.

Some mothers claimed that one could get worms in the stomach from certain foods. A distinction between stomach and intestines is often not made. It was said that the worms you get from drinking milk are small, whitish, and found in stools. Children can also get worms by eating mango and ice cream. Allegedly, infection starts with vomiting because the worms want to get out. When they are not coming out, they can bite in your heart or else make it difficult to breath. Other types of worms are located in the soil of the wetland and can enter the body through the feet (hookworm).

Children and the future

In Sri Lanka, education is highly valued, so as soon as an astrologer has determined an auspicious time for the five-year old child, it will go to school. Child-labour is therefore not as big an issue here as in some other Asian countries, but a considerable number of children do not get the education they could have. For the poor wetland inhabitants, having children can be costly even when education is provided for free, as is illustrated in the case below.

> Niluka the vendor
>
> Niluka lives in a wooden house in Munnakkare with her husband and her two boys. The house has no wooden floor, they just live on the black soil. In the corner are a few dirty foam cushions from an old sofa and a carton box with some cloth sticking out. There are no beds, only a wooden seat at the side. Usually Niluka sells her merchandise in front of her house, but now that it is raining customers are coming inside. Today she has also some fish for sale. Niluka is weighing the food items in the weighing scale in her hand while answering our questions. Her husband turned blind after a cataract operation and had to quit his job as a fisherman. They cook on the ground, which is impossible during floods when water is standing inside the house. Niluka earns about 1,500 rupees a month with the sale of fruit, coconut and fish. Only the eldest son goes to school, as they do not have the money to buy school items for both their children. For each schoolchild, exercise books (about 12 for all subjects), pencils and an eraser have to be bought and money for a seamstress who makes the school uniform, although the clothing material is provided for free.

To the question "what should a child do to avoid being poor when she or he is older", almost all the respondents answered that it should find a good job. Some others also mentioned a good education. Wetland parents, who are mostly poor, are quite tolerant when it comes to finding a wedding partner. While it is customary for parents in Sri Lanka to look for a suitable partner for their child, 69 percent of the respondents said that children should find their own partner. Twenty-seven percent of the respondents preferred to select their in-laws and a few said, "whatever the situation will be."

12.4 Food: you are what you eat

According to the women and men interviewed, food is important to be able to live and for maintaining bodily functions. "Your stomach will remind you that you have to eat", one man said. Some people thought that rice is the best for the body, others said that meat, fish, vegetables and fruits are the best foods. For children, milk products are considered important, and also green *gram*, which is a porridge made from beans. Meat, fruit and vegetables are especially good for growth. Others think that rice and string hoppers (noodles) are very good for children. Eggs were also mentioned. According to the respondents, most of the household money (about 65 percent) is spent on food, the rest on clothes, education and medication.

A man catching shrimp in the lagoon.

In more than half of the visited households in the survival survey, the respondents felt that their meals lack certain ingredients or food items. Meat, especially chicken, is mostly eaten on festive days, like weddings, Christmas and Easter. Nine women mentioned lack of milk or milk powder, and thirty said they missed fruits in their diet. The main reason the women gave for the lack of certain foods was that they could not afford to buy them. Two persons said that although the family diet was not deficient, it would be nice if they could buy cheese, jam and butter. Certain foods are avoided during early pregnancy. Hot (*ushna*) food items such as pineapple, tomato and certain kind of fish, are especially avoided in the first three months of pregnancy. Pineapple was believed to cause abortions. When women have an unwanted pregnancy, unripe pineapples are consumed to induce an abortion. During pregnancy and after delivery, mothers try to bring more variety into their diet by taking different kinds of green leaves. Jackfruit and shark fish are popular foods to improve the production of breastmilk.

Table 12.2 Twenty-four hour menu for a 3-year old girl

Place eaten	**Time**	**Description and amount of food/drink**
Aunt's place	3.00 pm	Biscuit and milk with sugar
Home	8.00 pm	Rice, potatoes, fish
Home	10.00 pm	Milk with sugar
Home	5.30 am	Milk with sugar
Home	8.00 am	Bread and banana
Home	12.00 am	Rice and vegetable curry

Source: Rapid Nutrition Assessment.

Presented above (Table 12.2) is a 24-hour dietary recall of a girl aged three. Her mother listed the food items consumed between 2 p.m. on a Wednesday and 2 p.m. on a Thursday. The girl lives with her parents in the resettlement village Awarakotuwa.

The mother of a sick boy of four listed the foods she had given her son during the past 24 hours. The boy got biscuits and milk (made from milk powder) for lunch, hoppers (flour and coconut milk) and milk in the afternoon, and noodles in the evening. On the day of the interview the mother said she had given him milk at 6.45 a.m. and noodles a few hours later. At 10.30 and 12 a.m., she had again given him milk with sugar.

12.5 Water and sanitation

In this section, the emic views on hygiene in relation to water and sanitation are discussed. Curtis (1998) postulates that the words dirty, clean, hygienic and unhygienic are not neutral scientific concepts, but are charged with social and emotional values. Rules about hygiene are found in every society. Sometimes hygiene rules are explained in terms of a search for health and the avoidance of diseases, whether people believe in microbes or not. But hygiene figures also in moral theology. Often, purity rules and hygienic promotion serve to keep the existing social order in place. In the conclusion of this chapter the existing practices in the wetland are listed in terms of their importance, and whether they are risky and should be discouraged.

The women interviewed had no complaints about the quality of the water but indicated that they had problems with the quantity. The short period of availability, and sometimes the distance to public taps is a problem for many. The people of the lagoon islands complain

especially about the supply of drinking water. The better-off households living in concrete houses in Munnakkare and Siriwardene often have one or more taps in their houses.

Charmian from Siriwardene

In the words of this informant: "We have four taps in the house but only one gives a little water early in the morning. Filling of the containers therefore takes a long time, also because the water-pressure in the taps is low. The houses in Munnakkare are better-off because the people there are living at the entrance of the island where the pressure in the pipeline is still high. The houses here are further away from the main road. This house has a flow-meter to measure the amount of water we use. We are lucky that we do not need to line-up for the public taps at four in the morning like many other people. Sometimes I can hear them fight over the size of the cans or the number of cans a person brings. The conflicts often start when people try to jump the line."

Water collection at 5 a.m.

In the marsh area the situation is perceived as being better than in the lagoon area, although the distance to the source of water is often greater. Whereas in the lagoon area it is mainly the women and the older children who fetch the water, in the marsh it is mostly the men who collect the drinking water for which a bicycle often is used or sometimes a boat or a motor-bike. In a few places, water-tanks have been placed along the roadside which are filled by water-bowsers, usually in the afternoon.

Half full or half empty

Nirosha in Pubudagama has complaints about the water supply. "The tanks are only half full most of the time, I often need to send my husband to the well close to the church to get water for bathing and for cleaning the kitchen utensils. We use the tank water mainly for cooking and drinking. These pitchers here are for storing the water from the tank and in the plastic buckets in the back we store well water. Our neighbours store their water in a large barrel outside. Some people here boil their drinking water, but I give only boiled water for drinking to my children when they are sick. The marsh water is only good to flush the latrine but sometimes we even use well water for that purpose."

Bathing

For a thorough bath, many people go to a place like a well or a particular place in the river or canal. The frequency of such baths depends on the distance and the type of work done. In one family in the marsh, the children travelled three kilometres by bike once a week to have a bath, while the mother walked that distance twice a week. She takes her bath and combines this with the washing of clothes. The women complained that, in the dry season, many bathing places become too saline and people use tap water to prepare a bath. Many people

from the Negombo Lagoon channel and some from the settlements in the marsh use water from the tap the whole year round for bathing because they claim that the marsh water has become too dirty. All people use soap for bathing.

Kakhusi
The latrines in the compounds are built about four to five meters away from the house. The women stated that this was done to avoid a bad smell in the house. Some households had taken a loan and were constructing a latrine. The women were complaining about the floods in the rainy season when the water is rising and the latrine pits fill up with water. To avoid such problems, toilets are sometimes constructed with a foundation of about half a meter and a small staircase to the latrine entrance. The reason for not doing so is mainly a lack of money. Some mothers let their children defecate on the ground or on a piece of paper even when there is a latrine. They will dispose the excrement in the latrine or just throw it away outside the premises.

Garbage
The inhabitants, those of the lagoon islands in particular, complain about the pollutants that are dumped in the lagoon, such as used oil and fish waste such as shark-heads. Especially during the floods, garbage, oil, fish-waste and excrement intermingle and pollute the habitat. An old fisherman told that in 1997 a Roman Catholic priest, in collaboration with the government, had set up a system to collect the household waste from the channel islands Munakkare and Siriwardene. Half cut barrels, provided with lids, were placed along the roads for the people to dispose their waste. “The lids disappeared very quickly and the bins are not big enough to contain all the dirt,” the man explained. “Sometimes the garbage collectors, who are supposed to come daily, skip a day.” The open bins enable the crows, dogs, cats and pigs to search through the waste. Some people are not motivated to use the collecting system, preferring to use their garbage for reclaiming land near their house.

12.6 Disease prevention and health-seeking behaviour in the marsh

The women in the survey were asked if they protected the members of their household against insects or illnesses in one way or another. Thirteen said that they did not take any protective measures. Mosquito coils were used in 60 households, and anti-mosquito bed-nets were used in 30 households. The bed-nets were mainly used for children, but in some households all the members slept under a net.

When a child has fever, half of the women interviewed give it home remedies first. Most of the women (52) do not keep stock of medicine and will go to the dispensary to get the medicines. Panadol is a very popular drug, followed by coriander and ginger. Six mothers would go strait to the hospital in case of illness of their child. Which choice is made depends on the seriousness of the child’s illness and past experience with the medical personnel. Ayurvedic medicine is sometimes used but is not as popular as it was in the past. According to the mothers, Western medicines work faster and can often be obtained free of charge.

12.7 Traditional medicine and native healers in Muthurajawela

Ayurveda, the all-in-one system
There is a long tradition in Sri Lanka in the use of medicinal plants. Nowadays, Ayurvedic centres and herbal gardens have even been established in some tourist hotels around Negombo. Many health practices and notions fall under ayurveda, including humoral values

in which food products are classified as hot, neutral or cold. Ayurveda is not only a system of medicine but also a way of life. Righteous life, wealth, fulfilment of desires, and, ultimately, salvation, all depend on a healthy and spiritual life. It is believed that matter is composed of five properties, namely solidity, fluidity, heat, gas and ether. In the human body they are explained in terms of:

- *dhatus* (chyle, blood, muscle tissue, fat, bone, bone-connective tissue, and reproductive fluids).
- *doshas,* three bodily and three mental doshas. (The mental doshas are *satra,* responsible for kind thoughts and feelings; *rajas,* for arrogance, desire, love and passion and *tamas dosha* is responsible for sleep, stupor and ignorance).
- *malas* (faeces, urine and sweat).

The human body is assumed to be in a healthy condition when the *doshas* are in a state of dynamic equilibrium. Any disturbance in the balance results in disease. Diseases may be caused by:

1. Incorrect use, excessive use or not at all using the five senses;
2. Indulging in activities that are recognised as leading to ill-health;
3. Seasonal changes;
4. External factors such as accidents, stings, bites;
5. Physical factors such as inflammation, growths;
6. Mental factors such as wrath, pride, vanity, falsehood;
7. Natural factors such as birth, old age, hunger, and thirst.

Ayurvedic treatment has a prophylactic and therapeutic approach, comprising the use of drugs (*Aushada*), proper diet (*Anna*) and a correct mental and physical behaviour (*Vihara*).

There are roughly two types of traditional practitioners in Sri Lanka. One is the college-trained ayurvedic who possesses formal medical qualifications acquired from one of the ayurveda colleges in Sri Lanka. These ayurvedics often prescribe western medicines in combination with ayurvedic preparations (Wolffers 1987). The other category of healers practices ancestral medicine (*parampara vedakama*), which is usually transmitted from father to son and in which no sophisticated knowledge of the 'humoral theory' is involved (Silva 1991). The latter are herbalist, snakebite specialist or bonesetter and generally do not use any western medicine. The herbalist is often called ayurvedic or veda by the people.

Although people in Sri Lanka often refer to ayurvedic values, ayurvedic treatment is not very popular in the wetland, but is often used in combination with western types of medicine. Ginger and coriander are the plant materials most often used in treating ailments like fever, cough and cold, often in combination with panadol, a western type of medicine. Vedas are mostly consulted in case of swollen joints or bruised bones. For problems of the joint, drinking boiled water with garlic would help to take away the pain. For the limbs, herbal oil wrappings containing different plant extracts are applied. Patients suffering from diabetes would take a herbal concoction containing roots, leaves and seeds in combination with a western type of medicine. Ayurvedic doctors are also visited for other health problems such as headache and back pain. Vedas do not ask for money but will accept something given in kind. Of course, people who are visiting a veda outside the area also have to pay for the bus fare.

Herat, ayurvedic healer

Mr. Herat is 75 years old and has been working as an ayurvedic doctor for 52 years. He lives on the small stretch of coastal land between the beach and the wetland. His practice room is a separate concrete building next to his house. Inside are two large wooden cupboards. One has about 40 drawers with Sinhalese names on it in which he keeps herbs, nuts, seeds, and tree bark. The other cupboard has glass sliding-doors and on the large shelves are many bottles of coloured glass. The bottles contain a liquid mix of 10 to 40 different vegetable ingredients. In the corner is a chopping block with the remains of a scrub.

Doctor Herat's practice.

Two people played an important role in the choice of Mr. Herat to become an ayurvedic doctor. The first was his uncle who was also active in ayurveda and whom he had assisted. The second was his teacher who inspired him by telling him a lot about the philosophic and historical side of this health system. He started his own practice in 1947 at this place between marsh and sea. The son of Herat has become a medical doctor and is opposed to ayurvedic treatment.

It takes about two weeks to prepare new medicines, which starts with the collection, hacking and grinding of the ingredients. A large part of the preparation of the medicines is done in the kitchen of the house. Here, Herat keeps a large mortar, a pestle to grind hard seeds etc., and a huge black pot to cook the medicine in. The size of the pills varies from a pepper kernel to a pigeon egg. The potions are sieved before they are poured in the bottles and ointments are put in jars.

The illnesses treated by him are fever, diarrhoea, headache, cold, infertility, and menstruation problems. The pills to strengthen women after delivery taste of cinnamon, sugar, liquorice and other indefinable contents. Often, patients have to prepare their own *kashaya*, or tea. Herat does not treat broken bones or mental illness. None of the medicinal plants are from Muthurajawela marsh and he does not collect the herbs himself but buys them in Colombo. They come mostly from India but some of them are from the interior of Sri Lanka itself. Payments by the patients are done in kind such as a chicken, eggs, rice, or, if the medical problem is serious, a goat or bigger animal.

Ritual healing

In the past, the caste system played a more important role in Sri Lanka than it does nowadays. For a considerable period of time, members of the highly esteemed fisher-caste (*karava*)

practised the profession of exorcism (*tovil*[20]). The high caste of landowners (*govigama*) had a traditional place in the sphere of ritual dance. The low caste potters (*oli*) and the low caste mat weavers (k*innara*) acquired a place as ritual dancers as well (Nurnberger 1998). The dance rituals from the drummer caste (*berava*) in southern Sri Lanka are very old. Their knowledge and skills were passed on from generation to generation and they provided drumming and dancing performances to royal courts and temples (Simpson 1997).

High-caste exorcists are sometimes called *mahateya*, which literally means gentleman, indicating their higher status as against that of the traditional *berava* or other low-caste exorcists. Some of the castes had the skill of making ritual objects, such as wooden masks or clay effigies. *Berava* exorcists, as well as potter or fisher exorcists, usually kept their healing techniques like *mantras* (magic words) and *kavis* (sung verses) a secret (Nurnberger 1998).

A wide range of ritual activities are involved in the propitiation of demons (*yaksa*), spirits and lower deities in attempts to alleviate personal affliction. A mediator or exorcist (*katadiya*), two drummers and four dancers come together for a performance for which large numbers of relatives and neighbours would be invited. In the mythology of the Sinhalese, there are nine *yaksas* and 18 *sanniyas* (illness causing demons). Apart from the costumes, ankle bells, masks and drums etc., the ceremonies also involve ritual objects such as flowers and fruits. The performances usually end at midnight with the *katadiya* being in a state of trance.

Dr. Silva, all-round therapist

Dr. Charles Silva, who is a Buddhist, has been working as a radiologist, an ayurvedic doctor, a snakebite healer, and a devil dancer. He is 57 years old and lives in a nice house in the marsh. He is the only *katadiya* in Muthurajawela and has been doing this work now for 32 years. In the past, however, devil dancers were common. He treats mainly poor Catholic people, as there are not many Buddhists or rich people living in the area. Sometimes Dr. Silva has 20 patients a day with various complaints including patients with snake bites, fever, and parents with a baby that does not drink. The number of snake bites range from two to eight per week. There are different snakes in the marsh. The cobra (*naja*) is one of them. Victims of bee stings also come to him.

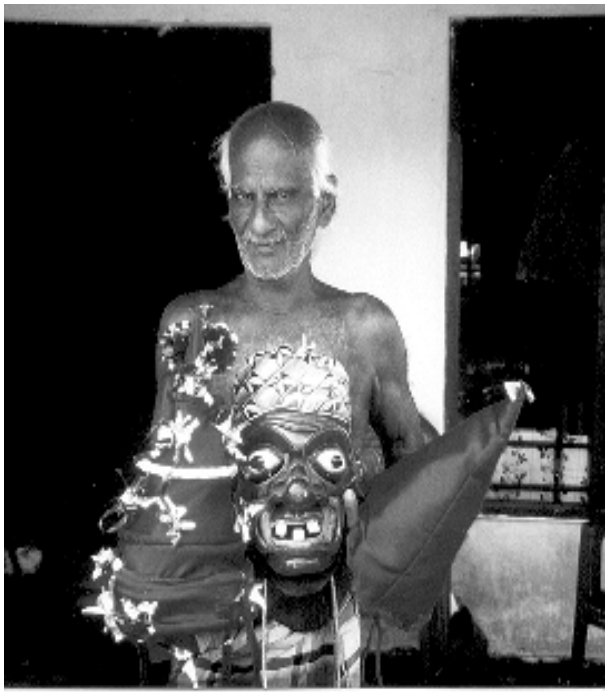
Sometimes Dr. Silva goes out to do a healing session but most of the patients come to visit him. Next to his house is a small building to treat patients, mainly those suffering from mental problems, but Dr. Silva also treats patients with headache or suffering from tiredness. One half of this small building is filled with attributes to call upon gods like Vishnu and Ghanesh etc. The other section in the structure is used to call the demons concerned. Both devils and gods are called by blowing on a seashell.

The type of a exorcism session depends on the seriousness of the problem and the amount of money people can afford. Sometimes Dr. Silva has one assistant, sometimes eight. For a large *tovil*, two assistants will go in the morning to the house of the patient to prepare the bed on which the patient has to lay down with flowers and coco-nut leaves. They also need to prepare offerings such as food and forest items.

[20] A *tovil* is a healing session through exorcism

The healing ceremony starts at about six o'clock in the afternoon and lasts till midnight. The patient has to cut the long green melon (*puhul)* that is placed on the chest and he or she will get a red and white string around the arm. The session ends at twelve with a thrilling yell, which supposedly is the moment the devil leaves the body. Seashells, flutes, drums and masks play an important role in a *tovil*. Red masks are used to approach devils (devils like red); the masks with glitters are used to approach a god.

According to Dr. Silva, the twelve major stars and the nine planets play an important part in the indigenous aetiology of disease, next to gods and devils. For example, wheezing is caused by the moon, and fever is caused by gods, but if you are paralysed or suffer from fits, it is caused by a devil. A devil is the servant of a planet. Some planets have two devils. Gods can control devils as they are stronger, but the problem is that they do not always care for people. The exorcist (*katadiya*) first talks to a god because with the help of this god he is able to chase away the devil. The *katadiya* is dressed in red and white. He has two sticks with fire in his mouth, and one in each hand and he dances till he gets infused by a god or by a devil, which is usually around midnight. Dr. Silva has two masks; one has five snakeheads on top. The other one is brown and is to approach the god Pathini. In the past, when income was higher, devil dancers were more common. The cost of a *tovil* varies between Rs. 8,000 and Rs. 10,000, including travel costs. Other patients, such as snakebite victims, pay in good or in kind. Dr. Silva has no medicines to treat patients. Patients need to bring their own medicine, which he tells them to look for in the marsh. The leaves have to be fresh.



Dr. Silva with mask.

Over time, tradition and ideas in relation to ritual healing performances have changed in Sri Lanka due to wars, rapid economic transformation, and the development of modern communication technology (Simpson 1997). The introduction of other dance forms, like stage and public dance, has also diminished the interest in traditional dance performances (Nurnberger 1998). In the wetland area, the strong influence of the Roman Catholic Church has also helped to eradicate native beliefs in devils, demons and magic. Still, a large number of people believe in supernatural beings and witchcraft, using protective symbols and exorcist practices.

The unsuccessful *tovil*

Soma is a widow who lives in the marsh with her two children. The family is Roman Catholic. Six years ago, Soma's husband became sick and developed a mental illness. Somebody used witchcraft on him by putting an imaginary thread on the path he used

to take. Sometimes bottles with oil, on which a spell is cast, are hidden in the garden by the ill-natured individual in the hope the victim will step on it. Soma, however, had not found such bottles in their compound. After her husband had stepped on the imaginary thread he became paralysed and was send to Ragama hospital. When he was home again, a *katadiya* and devil dancers were ordered to perform a healing session but had not helped him because, as he was paralysed, he was not able to cut the green melon himself, which is an essential part of the *tovil*. He died after a few months.

12.8 Conclusions

This chapter approached health issues as perceived by the wetland inhabitants themselves. The related research question reads as: *What are the emic views that can either cause, contribute to, or protect from sickness in the specific environment of the wetland, and what strategies do men and women use to overcome health problems?*

Many inhabitants of the marsh feel that they are not more exposed to disease than those who live elsewhere. This is different for the densely populated lagoon islands, where the inhabitants realise that they are more prone to the risks of communicable diseases. From the answers of the 100 female respondents, we have seen that illness is not a major issue for the people from the marsh part of the wetland. The respondents themselves refer to illness and disease in terms of signs and symptoms such as fever, headache and joint-pains, usually without mentioning the name of the illness. Floods and mosquitoes are felt to be the major problems in the wetland, but mosquitoes are seen more as a nuisance than as vectors of diseases. The main protection against mosquito bites used in the wetland are coils, and bednets for the richer households.

Marsh women often perceive their diet as deficient in terms of foods that they cannot afford, such as chicken, butter and cheese, more than in terms of lack of nutrients. Looking at the results from the nutrition survey from an etic point of view, the diet of the wetland people is simple, but the daily food intake appears to be sufficient. Although fruit and milk would have enriched the diet considerably, there seems to be a sufficient variety in the daily menu. Some people eat meat because of its taste, while others also realise that eating meat will keep them healthy. In many households in the wetland the consumption of alcohol is excessive. People know that alcohol can be a killer, but alcohol abuse is more perceived as a social problem than as the cause of prevailing alcohol-related diseases. The consumption of alcohol clearly has a very negative influence on the household, both from an economic and a health perspective.

The use of garbage to reclaim land is also a risky practice in terms of health. Most of the respondents have grown children who need to have their own dwelling space after marriage. On the lagoon islands, this problem is partly solved by enlarging the compound through land reclamation with garbage. The garbage blocks the water stream and places with black stagnant water are created. Increasing numbers of rodents and breading of mosquitoes in the waterlogged areas could result in an increase of disease transmission. The livestock that is roaming around also need food, and it is therefore understandable that some people do not support a garbage collecting system. The uses that can be made of garbage are very important to the dwellers, and many are not aware of the health risks involved. Below, two groups of existing health practises in the wetland are presented. The first one concerns practices that are beneficial and could be further promoted. The second group lists practices that should be discouraged.

Practices that have a *positive* impact on health:

- Boiling drinking water.
- Using soap in all the households.
- Using bed-nets and coils to avoid mosquito bites.
- Storing water in containers.
- Having good education, especially for women.
- Having children fully vaccinated.
- Prolonged breastfeeding.
- Feeding children more than three times a day.
- Using contraceptives.
- Giving children bi-annual treatment for intestinal worms.
- Feeding liver to children.
- Building a latrine at least 5 metres from the house.

Practices that can have a *negative* impact on health and should be discouraged:

- Throwing garbage in the marsh and the lagoon.
- Storing water in open barrels.
- Drinking *kasipu.*
- Walking on bare feet.
- Staying home when the house is flooded.
- Dumping oil and fish-waste in the lagoon.
- Keeping pigs in the wetland.
- Using uncovered garbage bins.
- Wading through floodwater.
- Eating watercress.
- Defecating in the field.

Some children in the wetland get a fetish or a *pottuwa*, a dark spot applied between the eyes, to protect them from evil. Baker (1998: 73) writes that the mark, which is made from a mixture of water and fried sago, neutralises the casters of the evil eye "The one who cast the bad influence by looking, talking, or thinking may very well be good people who do not know they have these powers." In the wetland, different explanations were given for this custom, but there could have been reasons that were not told out of shame or politeness.

In Muthurajawela, people still practice traditional medicine although modern health services have been promoted by the government in cooperation with international organisations such as WHO and UNICEF. When ayurvedic principles are applied to the health risks in the wetland environment, the following picture emerges with regard to the disturbances that reduce the well-being of the wetland population.

1. *Incorrect use, excessive use or not using at all of the five senses*: Indulging in excessive drinking of alcohol (*kasipu*) is clearly a violation of this principle. However, this is not typical for the wetland.
2. *Indulging in activities that are recognised as leading to ill health*: There is clearly a high risk for the many persons addicted to alcohol in the area and indirectly also for the other household members because of the negative impact on the household budget.

3. *Changes of seasons*: The floods in the rainy season spread excrement and other dirt over a wider area, bringing health hazards to the dwellers.
4. *External factors e.g. accidents, stings, bites*: Road accidents are less but the wetland inhabitants are prone to different kinds of bites. There are many mosquitoes, rats, and snakes entering the dwellings during floods. Also, people cannot afford protection against the bites.
5. *Physical factors e.g. inflammation, growths*: Injuries will need more time to heel because of the poor housing situation and dirty environment. Although people use soap, the little water available in most of the households delays good healing of wounds.
6. *Mental factors e.g. wrath, pride, vanity, falsehood*: These words are applicable to many households in the wetland. The illegal status of the settlers, involvement in illegal activities, alcoholism and rape are some examples.
7. *Natural factors e.g. birth, old age, hunger, and thirst*: Not much different from those who live outside the marsh.

It can be concluded that living in the wetland poses some specific health risks. These are acknowledged by the people themselves (emic view), but are also reflected in health care statistics. Ill-health as a consequence of alcohol abuse is the biggest problem. However, this problem is related to poverty and lack of prospects rather than the wetland environment as such.

13 Human Development in Conservation Programs

The last research question deals with the role of conservation agencies in improving the situation of the people in the wetland and protecting the environment. It was formulated as: *What is the role of the institution responsible for the conservation of the wetland resources in assisting people to overcome poverty and reduce the pressure on the natural environment?* This chapter presents the experiences of the Integrated Resources Management Program (IRMP) in Muthurajawela in relation to human development. Parts of this chapter derive from the IRMPs report "Lessons learned from the pilot projects" (in IRMP progress report no.11, 2000). Finally, some information is provided concerning tourism and awareness creation, which is one of the links between conservation and human development in an environment such as the Muthurajawela wetland.

The basic concept of IRMP is Ramsar's 'conservation through wise use'. The aim of the concept is that users of an ecosystem today become aware that their future livelihood will depend on the sustainability of the natural resources. Institutional arrangements can support local people in achieving secure livelihoods. Where dependency on wetland resources exists, the best conservation strategy is to establish linkages for sustainable use. Salafsky and Wollenberg (2000) classify the linkages between natural resources and livelihood needs into three groups: no linkage, indirect linkage and direct linkage. In the Muthurajawela wetland, two groups of linkages prevail. There are areas where livelihood and resources are indirectly or partially linked, and areas where livelihood and resources are directly linked. Most lagoon fishermen depend entirely on the natural resources of the area. By fishing in the lagoon, they are dependent on the wetland's resources. The majority of the families living around the marsh, however, are not directly linked to the area's biological resources. If dependence on wetland resources exists, the best conservation strategy is to secure their sustainable use. If dependence on the resources is partial or indirect, implementation of activities for economic substitution is considered a better strategy. This chapter deals mainly with the economic substitution strategy, which is the way the IRMP tries to enhance human development.

13.1 Integrated human development

During the final phase of the Wetland Conservation Project (WCP) in 1997, a follow-up program was prepared by the Central Environmental Authority (CEA) in which a human development component was integrated. This program was called the Integrated Resources Management Program in Wetlands (IRMP). It was defined as: 'Management of an area by a system of development and conservation interventions in a way that secures the continued usage of the available natural resources by people, in a manner that also serves the interests of bio-diversity conservation' (IRMP Inception Report 1998: 2). The program adheres to the concept of 'wise use' laid down in the Ramsar Convention. It was based on the following two principles:

- Integration of all different management activities.
- Involvement of local communities in management.

Income generation and community development
The community development program of the IRMP focuses on income generation, health and environmental education. It is mainly directed at the women in the wetland, who bear the responsibility for household management in the area. The socio-economic roles of many women in Sri Lanka involve domestic work and caring for other household members. Appro

priate programmes for women in the development program were designed in such a way that their economic activities in an enterprise would not conflict with their other roles. Youth training is also integrated in the program, as it would address the existing problems of school leaving at a young age and early marriage. It would also be a way to inform youngsters about other employment opportunities than just lagoon fishery. The IRMP program started early January 1998 and will last for five years. The project has recently rejected the word 'beneficiaries' for participants in the income-generating activities. The term 'client' is now used to promote a business-like approach and to avoid the inequality implied by the term beneficiary.

13.2 The pilot projects of the IRMP

An overview is given of IRMPs income-generating activities in Appendix 8 including those of partner institutes. Here we will discuss some of the enterprises in more detail. The overview shows that in the 24 pilot projects, a total of 506 families and 287 individuals were benefiting from IRMP projects in the year 2000. The total investment made by the IRMP for the 24 activities amounted to almost 12 million rupees and the accumulated earnings for the project's clients were around 23.5 million rupees as per 30 September, 2000.

Pandana products

Pandana (screwpine) is a rapidly growing plant with sharp leaves. It is quite common in the Muthurajawela marsh. Fibre is extracted from the leaves. These fibres are easy to colour and very suitable for weaving small items. IRMP involved a Catholic priest to select the participants for training in pandana weaving. Most of the selected women were educated up to A level, which amounts to ten years of education. The IRMP pays for the salary of the trainer, 5,000 rupees a month, and pays the trainees twenty-three rupees per day for six months. After the women have completed half a year of training, Sri Lankan companies pay them a monthly amount depending on the number of requests for the produced artefacts. It can take some more time before a woman is skilled and reaches an efficient level of production. The main reason for women to drop out is the low prices offered by the buyers of the products. Their salaries amount to only between 40 and 60 rupees per day. As a result, a number of women left the project to take better paying jobs in the garment industry.

> The lady pandanus weavers
>
> One of the pandana centres is located in the middle of Negombo town. Only two women in the group are married. Sulani is 17 years old and is one of the 25 women working in this place. She explains how the leaves of the pandana are split in smaller and bigger strips. The strips must be boiled for about three hours and then dried for almost a week. After that they are dyed and dried again. The women make bags, wallets and placemats out of them. It takes 15 hours to produce one placemat, which fetches a price of 80 rupees. Cutting the pointy leaves from the cactus-like plant is done by women. Sulani complains that the leaves damage their hands and that the sun makes her skin darker while cutting the leaves. The women are trying to find a man to do the harvesting. Preferably, a man with a bicycle who would also be able to transport the material to the centre.

Discussion

The training focuses only on the technical aspects of weaving. Issues such as planning and marketing are not addressed. The women in the program had too high expectations about their

income, and were not properly informed about the prospects. The appreciation for traditional handicrafts has diminished in Sri Lanka. The handicraft commissioners still apply outdated methods and show a lack of innovation. The costs of producing the raw material proved to be higher than anticipated and earnings are low. The commissioners consider the low earnings to be normal because the prices are a reflection of demand and supply in the market.

Coconut carving

From the coir of the husk usually rope and mats are made, and from the coconut shell artefacts and kitchen utensils. Apart from rope and utensils, the nut with the husk can also be used to make decorations like animals and human faces. The coconut arts centre, situated in Negombo, started operating in October 1999. Training is given to a few men and women for a period of six months. The trainees work five days a week and sometimes also on Saturdays if there is an urgent order. There are also part-time workers like schoolboys. Trainees get 22 rupees a day which is paid by the IRMP, who initiated the activity. The IRMP also does the monitoring of the project and looks for new markets to sell the end products. A shop in Colombo sells the big items for 200 rupees and the smaller items for 120 rupees each.

From woodcarving to coconut-carving

The trainer of the coconut-carving project used to be an artisan in woodcarving. Sculpturing coconuts is a fairly new technique. Heads and objects like elephants are made from big nuts, and from the smaller coconuts, rabbits, tigers and monkeys. Uncommonly small nuts are used to make rats. Holes in the nuts are made to clean out the fruit. The trainer shows a few samples. Samples have been shown to various potential buyers like handicraft shops and some have placed orders. The trainees share 40 percent of the profit. Sixty percent is spent on buying new coconuts, tools, sandpaper, etc. The two male participants are also involved in prawn-fishing in the lagoon, yielding between 2,000 and 3,000 rupees per month. A woman participant has never done any handicraft like coconut carving before, but in school she used to be very skilled in painting and flower making.

Discussion

Lack of commitment and support from the partner organisation in marketing the products resulted in the drop-out of five trainees. Three participants completed the training and started producing at home. They sell their products on the Negombo tourist market. The participants had high expectations in terms of income and other benefits. The fishermen had apparently expected immediate rewards and lacked the patience in mastering the carving skills. The women did a better job at that.

Coir products

Since Muthurajawela is situated in the coconut belt of Sri Lanka, income-generating activities based upon coir handicraft has a strong tradition. Domestic production of coir products is mainly done by women. The pilot project started with the leading exporter of coir-based products, Hayleys Exports Ltd. A large group of women of poor families from various locations in the marsh became interested and were trained by an experienced trainer from the south of Sri Lanka. Orders were given for the production of bird nests, transport nets and other coir products. IRMP arranges transport, training and workshops for the clients.

A transport net made from coir rope.

Women's enterprise

Renuka is the leader of the women's group in Delatura, Muthurajawela. Two other leaders are situated in other parts of the marsh. Their groups consist of around 20 women each. Monthly meetings for all of them are organised by the IRMP. Making bird nests from coir rope started in February 1998. The nests offer birds the possibility to lay and sit on eggs. Hayleys provides the coir ropes per kilogram and the end product is bought by them in kilograms. They pay five rupees for one kilo of end product, of which the leaders pay the participating clients 4½ rupees. In this way, the leaders earn ½ rupee per kilo end-product. The leaders collect the products from the clients and a project assistant from IRMP buys the bulk from the leaders and brings the coir products to the exporter Hayleys. A part-time producer earns about 2,500 rupees and a full-timer around 5,000 rupees per month. The women's groups have also started a saving system in which they save 100 rupees per month. The leader keeps a record of all the clients involved, the material received, and the finances. Another activity carried out by them is twining, making small parts of coir rope into a long rope. A third activity is making coir nets that are used in the transport branch.

Discussion

Sub-contracting can be beneficial for both the company and the producers. The company can make significant savings on floor space and overhead costs. The producers are able to work at home, and thus save transport costs. The producers have a strong desire to save as soon as they have a steady income. A saving scheme with a local bank is an important stimulant for their continued participation. Intimidating tactics by the sub-contractor such as arbitrary reduction of payment on finished products (due to high shipping costs and low price paid by the foreign buyers) often had to be overcome through mediation provided by the IRMP.

Animal husbandry

First a feasibility study was undertaken by the Department of Animal Production and Health (DAP&H) because of the large investment involved. From the start of the project, the DAP&H was involved because of the risks posed by the harsh environment. From a natural resources management viewpoint, the project provided an opportunity for recycling fish waste, now being dumped into the Negombo Lagoon, into pig food. Goat breeding provided an opportunity to utilise *Annona glabra*, an exotic invasive plant, as fodder and for pen construction. Several sites in Muthurajawela area and potential farmers were identified using a list with criteria. A church-based organisation plays an active role in the program.

The church and animal husbandry

In May 1999, the farmers were given money from the project to prepare the stalls. Five families in the marsh are involved in pig breeding, ten families do pig fattening. Initially ten families tried goat farming, but of this group there are only three families left. The first six pigs were bought by the church for 30,000 rupees in order to start the first cycle. The farmer/breeder was given one male and three female pigs. When the newborn piglets are two months old, and weigh about 15 kilos, they are sold for 2,000 rupees per pig to a pig-fattening farm. The church will receive 4,000 rupees after each cycle. After five cycles, the money is invested in a new group of farmers. Pigs have proven to be better animals to keep in a marsh area than goats. Goats get diseases like pneumonia and influenza or get sick from drinking marsh water. Dr. Bandero is the project veterinary and visits the farmers every week. He vaccinates the piglets for Japanese encephalitis (JE) and swine fever, and takes part in the two-day training the church organises for the new farmers.

Discussion

The selection of the client-farmers was partly politically motivated, which resulted in a number of incompetent or poorly motivated participants. After their departure, the farmers became more united, which led to improved performance. Regular dissemination of information to the farmers was important for animal growth, the selection of fodder, and disease prevention. The fish-waste project and pig farming could be combined. Fish-waste can be used as high protein feed for pigs, although the market was threatened from time to time by cheap meat imports from Australia.

Poultry

IRMP sought the co-operation of the Samurdhi Authority, a governmental financial institution, to implement the project. Poor people in the marsh area who were interested in keeping poultry were selected. The objectives of the project are threefold: to supplement protein in the diet, particularly that of children; to increase the income from the sales of surplus eggs; and to promote the utilisation of *Annona glabra*, an invasive marsh plant. The program started with 40 families and 1000 chickens. Each family received 25 chickens. About half of them were female and produce eggs, while the other half were cocks. The latter are slaughtered on reaching maturity.

First the chicken then the eggs

Anoja lives in a small house with a spacious garden in the marsh. She keeps two goats (two died), a pregnant pig and she has 13 female chickens, which give her about ten

eggs a day. The family of five eats about 18 eggs a week, which leaves them with more than 200 eggs a month for the market. She also gives the chicken *kiriwella* to eat. This is the local name of a creeper plant in the marsh that the chickens like. She still has to make a special place in the poultry ran for the birds to lay their eggs. Now, the other chickens destroy the eggs sometimes. She stopped keeping a record of the type of food given to the birds, their health status and the finances of the poultry project.

Discussion
The selection of the beneficiaries by the Samurdhi Authority was in some cases politically biased. This led to a number of confrontations with other members of the community, resulting in the poisoning of two batches of poultry. However, poultry raising on a small scale, using a mixed breed, is technically feasible. The eggs and meat can be sold for a good price because the demand is high and selling therefore easy.

Health improvement
One of the objectives of the master plan is the improvement of the health and nutrition situation of the inhabitants of Muthurajawela. A survey conducted by the Medical Research Institute in the marsh area in 1992 revealed a number of problems such as anaemia, malnutrition, and alcoholism (IRMP progress report no.11, 2000). The worst affected were children and pregnant and lactating mothers. According to Janodaya, a NGO that has worked with the marsh dwellers for over ten years, malnutrition in the area is the result of a number of factors such as lack of sanitation, poor hygiene, low income and lack of access to health services. Janodaya planned an integrated health and nutrition improvement program in co-operation with the IRMP in February 1999.

Discussion
Janodaya, for internal reasons, started implementation a year after signing the agreement. Once the program started, it lacked a systematic approach and commitment from the project officers in attacking health problems. To the IRMP it became clear that NGOs that had received donor subsidies for a long time lacked the understanding that project results and sustainability should be measured in terms of outputs and not in terms of funds spent (IRMP progress report no.11, 2000).

Home gardening
In the promotion of home gardening, IRMP decided to follow two models. First, a scheme to be implemented by the agrarian services department, and second, a similar scheme to be implemented by the NGO Anodal. In this way the outputs could be compared and lessons learned. The DAS prepared with the IRMP a joint proposal for 100 families residing in the marsh. The project started with an extensive soil survey, training and the provision of garden tools. Janodaya prepared a project proposal and a budget for 400 families. In the budget, loans were included of 500 rupees per family as part of a revolving fund, following the principles used by the Grameen Bank in Bangladesh. This means that groups of five persons are responsible for each other's implementation and repayment of the loans.

Discussion
The department responsible for agrarian services was seriously understaffed and the advisor lacked transport, which limited the ability of monitoring the project. The lack of support, however, had a positive effect on the clients who, out of frustration, organised themselves to continue the enterprise. They selected leaders, held regular meetings and shared experiences.

Many gardens suffered from the salty ocean wind and the quality of the poor soil, and a large proportion of the vegetables were destroyed by floods. Insects and other pests also damaged the plants. As there were few harvested vegetables and therefore little money, many participants dropped out of the program. A more careful selection of the sites and certain prevention measures could have reduced the losses and the negative impact it had on the gardeners. Adopting new concepts such as 'organic farming' without having the technical knowledge about it is risky. Organic farming is not just the same as the non-use of chemical fertiliser, insecticides and pesticides.

13.3 Public awareness on nature conservation

Bringing conservation messages to the people is not simple. To reach all layers of society, public awareness should contain different messages based upon solid information. Workshops were held to explain the reasons behind the conservation plans and their possible benefits to the wetland inhabitants. Agencies from outside the country (RAMSAR, Asian Wetland Bureau, Wetlands International, the UN and the Media) were involved as well as national organisations.

Awareness creating activities
Awareness creation in order to reach the general public in Sri Lanka comprised of messages such as advertisements in newspapers, TV spots, radio interviews, excursions for the press, printed leaflets and flyers. A number of video films were made and broadcasted. For the school children in all primary schools of Sri Lanka, a schoolbook was prepared on wetlands, their values and the need for their conservation. Special programs for schoolchildren are available at the visitor centre, including a video presentation.

The Muthurajawela visitor centre
The Muthurajawela visitor centre was officially opened in July 1996. Its main purpose is to generate money, which is used for the maintenance of the building and for conservation management. Another purpose of the visitor centre is to show the beauty of the wetland to the public. The main attraction is a guided boat trip of two hours through the marsh and a part of the lagoon. There is a nature trail, which takes half an hour walking, and a small replica of a fishing village where the visitors can see how marsh people live.

At the end of 1997, in 18 months time, the total number of visitors was more than 21,000. About 90 percent were Sri Lankan visitors, half of whom were school children. Muthurajawela, situated close to the sea and the airport, is strategically located to attract foreign tourists who stay in one of the thirteen main hotels around Negombo (Faber 1998).

13.4 Conclusions

The focus of many environmental projects, apart from keeping the ecosystem in balance, is on management structures to achieve and maintain sustainable livelihoods of the poor people involved. The IRMP program was able to start a large number of pilot projects in the wetland in a period of one-and-a-half years. This required a lot of investment in terms of time and training. The encroachers, women in particular, did not have the skills and means required for self-employment. They needed extensive training, empowerment, and organisational skills to enhance their capabilities in planning, time management and marketing. The private sector offered a lot in terms of tested technologies, training facilities and markets for the products. Their business-like approach (deliver first, pay later) led to effective partnerships in the

implementation of pilot projects. The selection of the participants often took place in an arbitrary, politically influenced way and resulted in a high drop-out rate. At the beginning of the IRMP employment program, the number of participants was 1024. This number has decreased to a total of 500 as per August 2000, meaning that 51 percent of the clients had discontinued their participation. The appreciation for handicrafts made from natural products has diminished in Sri Lanka. The products have to compete with cheaper mass-produced products. Also, modernisation and changed life-styles make it less interesting to become involved in the processing of natural products, even for poor people. The stagnant market and the low prices offered for the products did not benefit the participants. The participants were blamed for not having a realistic view of the income level. This may be true, but the income derived from handicrafts should also be sufficient to keep them interested. If the clients had seen clear benefits flowing from their work after a short time, the drop-out rate would probably have been much less.

Although the IRMP follows a 'women-in-development' approach, no specific gender strategy was applied, such as Molyneux (in Moser 1989) proposed for projects on development planning (see Chapter 4). Clearly, the first need of the women in the wetland, namely increasing the household income, was not met. The profits made after a hard day's work were disappointingly low, and many dropped out for this reason. The practical gender needs of the wetland women at the household level are not only to earn an income through productive work, but also to fulfil their responsibilities in domestic work. This involves child care, family health and food provision, along with community requirements and basic services. The gender needs of the project could have been formulated by the women involved. True, the IRMP's primary goal was not women's emancipation or gender equality, but the wise use of Muthurajawela wetland. However, a large part of the success of integrating human development in nature conservation is in meeting practical gender needs. Designing plans for involving women in income-generating activities that take women's domestic role into account is a good start. The implementation of such plans comes next. It is not easy to assess whether women were empowered by the interventions. From the cases presented, we may conclude that the training followed by them and the experience they gained did empower many women in one way or another. It increased the women's self-confidence and helped them to gain certain skills. At the household level, it can be said that the inputs, in terms of women's time and effort, hardly outweighed the output. The earnings were small. Only a limited number of women benefited in a material way. It is difficult to determine at this stage which participants will be independent entrepreneurs in the future and which participants will always be dependent on project assistance.

What is important is that communities living in or near a conservation area consider the area as their asset. The hypothesis of the Biodiversity Conservation Network (and used by Salafsky and Wollenberg, 2000) that if livelihoods benefit from opportunities offered, conservation of biodiversity will increase, still has to be proved in Muthurajawela. From the experiences gained so far, it can be concluded that some income-generating projects are a success and probably also sustainable, while others will have to be set up differently to see whether they can be made a success. There are also pilot projects that failed, with the number of participants reduced to half in a period of less than two years.

14 General Discussion

This last chapter discusses the theoretical and social significance of the findings presented in the previous chapters.

14.1 Livelihood strategies, resources and assets

This research dealt with poor people living in a wetland. It can be assumed that everybody, poor as well as rich people, have livelihood strategies. Livelihood strategies have a relatively long time perspective, whereas coping is a more or less immediate response to a situation of stress or crisis. It appears that the people in Muthurajawela wetland are struggling and balancing between livelihood strategies and coping. We referred to this behaviour as coping strategies. Coping strategies are undertaken to cope with a foreseeable or a known situation of stress. During the rainy season, when the area gets inundated, many wetland people are coping from day to day until the water has disappeared. They temporarily forget about their long-term strategies, trying to keep their house and household items intact, hoping that relatives will take proper care of the children temporarily entrusted to them. During the floods, people survive on little food and often take risks to find more, praying that they will be spared from vermin. This struggle for survival is reflected in the title of the thesis. Survival then almost literally amounts to keeping one's head above the water and trying to stay healthy at the same time.

The majority of the wetland inhabitants migrated from areas not far from Muthurajawela. It was a move to save the necessity of paying house rent, but with the consequence of becoming an illegal settler. For many it was the only option or the best thinkable strategy at a particular moment. Some people became involved in illegal activities such as fishing in the territorial waters of other countries. Others were able to find a job oversees to maintain their livelihood and often that of their extended family. Generally, the wetland inhabitants do not have resources or assets of any significance. Their most important household resources are a good health and social capital. While social capital can be seen as a resource in itself, it also has an intermediary function, because through social capital people obtain access to other resources (Niehof 2003). Good health is important because people's ability to work depends on it. At the same time, members of poor households who do not have enough assets are vulnerable to malnutrition and disease. Health problems are worse for people with limited resources because they are less able to afford medical treatment. This affects the resource base of the household livelihood system in a negative way and may plunge the household into a downward spiral. This process is reflected in Table 14.1 and discussed in section 14.2 (household liabilities). Apart from good health, social capital is another important resource for households in the wetland in their efforts to achieve livelihood security. Pretty and Ward (2001) identify the following dimensions in the concept of social capital. In their opinion, social capital consists of formal and informal rules, norms and sanctions, connections through networks and between groups, all of which facilitate relations of trust, reciprocity and exchange. For households in the wetland, social capital is an essential asset which is at risk when having a household member who is an alcoholic or in case of conflicts.

Items of gold are an important asset, although they are rather scarce in the wetland. Jewellery is the first property in the wetland households that is sold or pawned when money is needed. Pawn-shops offer a way to enable low-income households to obtain cash. In Sri Lanka, the moneylenders in the informal credit system often charge interest rates of 120 percent or more per year. According to Olsen (2002), it is the low-income households who pay extremely high

interest rates on small to medium loans. The poorest households and poor farmers tend to be excluded from lenient credit conditions. The amount of credit and savings generally fluctuate in relation to income. Loans for farmers are often used for diversification of the livelihood portfolio, such as adding a new crop or start poultry rearing. In the wetland, households rely primarily on non-agricultural activities, such as petty trading, fishing and casual labour. The money that people receive when selling their jewellery is often used for improvements of the house.

When Marzano (2001) asked villagers in Moneragala district, in the dry-zone of Sri Lanka, to explain to her what it meant to be poor, they came up with several indicators. The following things were mentioned: limited access to paddy land; no available land for cash crops and thus no income; being elderly with little access to social networks and no children to look after you; illness and inability to work; social problems linked with alcoholism (depletion and non-maintenance of household assets); and 'laziness', not being interested in working or increasing one's capabilities. Thus the villagers seemed to associate poverty primarily with limited access to assets and social problems. The perceptions of the people in the wetland in relation to poverty and well-being are of the same kind, except for access to arable land. Instead, the illegal, hence insecure, residential status was a major obstacle for the people in Muthurajawela in achieving well-being and self respect.

Senaka Arachchi (1998) did a study among rice cultivators in the dry zone of Sri Lanka where the majority have a poor economic status. The respondents were asked to identify what remedial measures were taken by them to overcome hardships created by drought. In the answers of the farmers, purchasing food on credit from traders was the most commonly adopted strategy. This seems to be possible mainly for the more credit-worthy farmers. Food stamps provided by the government constituted the most important source of income. The mortgage of jewellery and household goods ranked much lower as a coping strategy.

The main strategy adopted by the households in another area of the dry zone at the time of the 1981 drought was cutting down on meals (Senaka Arachchi 1998). Cutting down on meals, to save money for house construction, could also be observed in the wetland. However, in the wetland the situation was never as serious as in the dry zone. It is, of course, possible that some families in Muthurajawela were reluctant to admit to an outsider that occasionally they have to endure hunger. Still, the situation in the dry zone seems to be more critical. The dry zone is more isolated than the wetland, which is situated in-between two large urban areas and close to the capital and the airport. The possibilities for wage labour near Muthurajawela are better than in the dry zone, while there are also more support agencies in the area, including the church. The term 'crisis', therefore, seems more applicable to many of the dry zone communities in times of drought than to the wetland inhabitants in times of floods.

Gender and livelihood

In the past, women in Sri Lanka were respected and enjoyed a reasonably good life compared to women in other countries in the region (Baker 1998; Caldwell 1993). They either lost their favourable position or the positive situation for women in the past has been exaggerated. According to some scholars (Dunham and Jayasuriya 1998), the popular image of Sri Lanka as a democratic society, more prosperous and better educated by Asian standards, is a myth. In terms of political violence, social marginality, and ethnic conflicts, Sri Lanka is no different from its neighbouring countries.

Since 1983, the situation in Sri Lanka has deteriorated and became increasingly visible when the problems started between the LTTE and the Sinhalese majority. According to UNICEF and UNFPA, there is a growing trend of sexual and domestic violence against women in Sri Lanka. The alarming rate of suicide and alcoholism in connection with violence will be discussed in section 14.2. The deteriorating situation is also apparent from the statistics on children in difficult circumstances. Police records and other studies estimate that around 3,000 to 10,000 children live on the streets, while 30,000 are trapped in commercial sex exploitation and 50,000 to 100,000 engaged in child labour (United Nations 1998). We have seen in the cases described in this thesis that sexual harassment and violence is not unknown in Muthurajawela. Moreover, Negombo is one of the major centres for gay-sex tourism. Although Sri Lanka is a country in which HIV/AIDS prevalence is still relatively low, risk factors are present and are likely to contribute to an increase in the spread of AIDS. In 1992, there were 30,000 child prostitutes, 20,000 of whom were boys (De Zoysa 1995).

The problematic personal situation and the poor employment possibilities force many women from Muthurajawela to look for wage labour elsewhere, including overseas. Because of the high demand for domestic servants in many countries, it is relatively easy for women to find work abroad. Expatriate workers are allowed to import household goods tax-free upon returning to Sri Lanka. The pressure exerted by relatives on female or male expatriate workers to do so should not be underestimated. In Muthurajawela, the IRMP initiated a number of income-generating activities for the people in the area. Women, who until then had little opportunity to generate money, were given the chance to participate. The IRMP realised that women have great potential for contributing to a sustainable future for their families and the wetland as a whole, which is why the projects that are discussed in Chapter 13 were set up.

Labour is an important resource to households. Concerning the labour situation in the wetland, it has to be noted that it is culturally unacceptable for women to take part in fishing. Women only have access to fishing-related jobs, such as selling the fish. A similar sexual division of labour in a fishing community was observed in Madura, Indonesia (Jordaan and Niehof 1980; 1982). It is also what Stirrat (1988: 90) observed at Chilaw lagoon, about 40 km north of Muthurajawela. “As far as I know, no women has ever been fishing, whilst very few men have ever tried to sell fish, and when they have tried it has been a failure.” Stirrat noticed that the subordination of women was mitigated by the fact that, through selling the fish, the women control the money income of the household. At Negombo, certain fishing methods are restricted. Fishing methods that are destructive to the ecosystem of the wetland are strongly discouraged or even prohibited. Also the catches at Negombo Lagoon have diminished as a result of over-fishing, affecting the livelihood of the families who depend on fishing.

Female headship of households forms a separate issue in the livelihood discourse. In our sample of 100 households we only found ten women-headed ones. These numbers are too small for generalisations. However, the fact that in this study women-headed households have a lower amount of savings than male-headed households (see Chapter 10) can be an indicator for the relatively difficult position of women-headed households in the study area. According to Chant (1997b) and many other scholars, female-headed households are in general more poverty-prone than male-headed households. Women’s access to financial resources is generally less compared to that of men and studies have shown that it is still common for women to earn less than men, even when they do the same kind of work. Female-headed households are often socially marginalized also in Muthurajawela. It was interesting to learn from a study carried out in Kwa-Zulu-Natal, South Africa, that female-headed households were not always worse off in comparison to male-headed households. Because female

household heads were less constrained in their mobility than women in patriarchal male-headed households, they were better able to diversify their economic activities (Mtshali 2002).

Women in developing countries usually have lower levels of education, they are expected to take care of the children and do the household chores. Also in Sri Lanka, women are expected to be responsible for childcare and household duties, but there is hardly any difference in the level of education between men and women. This is also the case in Muthurajawela.

The stereotypical image of the household as a unit that maximises joint welfare does not always hold true (Kabeer 1991; 1994). As Niehof and Price (2001: 10) state: "Within the household there are joint strategies and there is joint decision-making. But, at the same time, individual members can have their own strategies and take their own decisions, either or not for the benefit of the household as a whole." The household remains a domain of both cooperation and conflict. In male-headed households in the wetland, the wives have difficulty in claiming ownership of the jewellery they wear. Control over resources and assets often has to be negotiated. In a debate on household economics, Amartya Sen suggests that women in traditional societies may be subject to the 'perception bias' they have that takes inadequate account of their own self-interest.

> *"Intra-family divisions involve significant inequalities in the allotment of food, medical attention, health care and the like (often unfavourable to the well-being, even survival, of women). The lack of perception of personal interest combined with a great concern for family welfare is, of course, just the kind of attitude that helps to sustain the traditional inequalities"* (Sen 1990: 126).

As Sen (1990) and Agarwal (1994) argue, the economic contributions of women are undervalued in women's own perceptions. Economic changes also bring about changes in gender perceptions, as does women's involvement in employment. The earnings from income-generating activities of the women in our sample (see Chapter 13) were, in their opinion, rather disappointing, and too little to bring about a shift in gender perceptions. However, their participation in these activities proved to be important for their self-esteem.

Household duties are often regarded as not contributing to the household's output and tend to be classified as unproductive. However, they contribute to the sustenance and survival of the household. Performing these duties forms part of women's reproductive role as defined by Moser (1993). This role comprises more than childbearing and child rearing. It includes the care and maintenance of the household's present and future workforce. We have seen that young people in the northern part of Muthurajawela tend to continue to live with their parents also after marriage, which even extends the period during which women bear the burden of day-to-day reproductive responsibilities. Given the economic and social problems in the wetland, carrying out their reproductive role is a considerable burden for women. The fact that women nowadays have access to family planning methods means that they are able to relieve this burden by limiting the number of children. Most women in the wetland use some kind of family planning method. To them, family planning provides the means to better control their own fertility and reduce their reproductive burden.

14.2 Household liabilities

Accumulation of resources and assets in the wetland is constrained by factors not directly related to the characteristics of the wetland environment. The frustration of being poor and living on land that will never be owned is probably an important factor that contributes to alcoholism. As the case studies in this thesis show, household members do not always work together for the prosperity of the household, and family members do not always take responsibility for each other's well-being. Lack of co-operation and tension within a household or family can be regarded as a liability to the household production of livelihood and well-being. Alcoholism and conflicts in the family bring a household in a downward spiral. An alcoholic or a person with poor health, is a liability. Already at an early stage of this research, I was confronted with the problem of fitting these destructive factors into the livelihood framework. High alcohol consumption, for example, threatens the health of the consumer and results in poor livelihood of the household as a whole.

In my opinion, the framework presented in Chapter 4 gives a rather one-sided picture of livelihood and livelihood strategies. It emphasises resources, assets, strategies and behaviour as contributing to livelihood generation and sustainability. What is missing in the framework from Berman et al. (1994) and in the theorising on livelihood and health, is a link to harmful actions. When looking at the livelihood portfolio, where emphasis is put on the bundle of activities people undertake to generate (sustainable) livelihood, negative impacts should be taken into account as well. Regarding the household's finances, income of poor households is not always used to improve livelihood, and next to health-producing behaviours there are also health-damaging behaviours. Instead of being a resource or asset, negative behaviours become a liability to the production of livelihood and health.

Niehof (2003) observes that livelihood generation proceeds in a circular rather than a lineair mode, and that livelihood outputs affect subsequent opportunities for livelihood generation in a positive or negative way. Bebbington (1999: 2032) notes that "the separation between the inputs and outputs of a livelihood strategy is only artificial: the environment that a livelihood helps build (or destroy) and the social networks that it helps create (or weaken), in turn affect any subsequent income earning activity." Table 14.1 shows how the destructive use of resources and assets (throughput), which we refer to as liabilities, creates negative outputs that, in turn, have a negative impact on inputs, particularly on health and social capital. This renders the poor households concerned very vulnerable.

Table 14.1 Behaviour in poor households that can lead to *insecure* livelihoods

Inputs	**Throughput**	**Outputs**
Resources and assets	*Destructive use of resources and assets*	*Household vulnerability and decreasing well-being*
Time Human resources (good health) Material / financial capital Social capital	Alcohol abuse Drug use Heavy smoking Gambling Unlawful / illegal activities Misbehaviour	Disease and stress Death Debts Deteriorating social-relations
Quasi-supporting networks such as: alcohol breweries/bars, networks of drugs producers or dealers, gambling syndicates, gangs, etc.		

Negative feedback

We have seen in Chapter 4 (Table 4.1) that the supporting networks are related to secure livelihoods. These are usually non-profit organisations, some of which are dependent on donors. In Table 14.1 (last line), we see that the networks involved in activities that can lead to insecure livelihoods, which we call quasi-supporting networks, are on the contrary mainly profit-making institutions. These kind of institutions stimulate addiction.

Consumption of alcohol, a social liability

Poverty is one of the main reasons for the high consumption of *kasipu*, and alcohol abuse leads to more poverty, which results in the downward spiral we already referred to. For the many men in the marsh, the consumption of alcohol is a way to forget their problems and to socialise with their peers who are in a similar situation. The social setting and the intoxicating effects of alcohol creates an imaginary better world. As Mary Douglas (in Joffe 1998: 298) puts it: "The social setting and intoxicating effects of alcoholic beverages […] make an intelligible, bearable world, which is much more how an ideal world should be than the actual painful chaos threatening all the time." The study in the wetland reveals that issues such as unemployment, poverty, illegal residency and relational problems are factors that contribute to alcohol abuse as a means to escape from the realities of life.

Sri Lanka as a whole has not only the highest rates of alcohol consumption in the world, but also one of the highest suicide rates. In the past 50 years, the suicide rates in Sri Lanka escalated from 6 per 100,000 in 1950 to 56 per 100,000 in 1992. In other Asian countries these rates were 7 and 16, respectively, during the same period (Silva and Pushpakumara 1996). Studies on suicide by pesticide poisoning carried out in Ratnapura district revealed that alcohol abuse was the main direct cause of suicide. Thirty-two percent of the people who committed suicide were under the influence of alcohol when they drank the poison. Other causes mentioned in the study were: family disputes (25%); marital problems (19%); and emotional distress (13 %). For many people addicted to alcohol, the act of drinking pesticides is an impulsive one, usually committed after an argument with somebody (IWMI forthcoming).

Biological causes can also play a role in suicide. A study in the Netherlands showed that genetic components play an important role in suicide behaviour (Ekkelboom 2002). Evidence on the variation in suicide by ethnicity within Sri Lanka reveals that Sri Lankan Tamils and Sinhalese scored highest. The suicide rate is considerably lower among Indian Tamils and

Burghers (Silva and Pushpakumara 1996). Whether the suicide rate is different in Muthurajawela compared to the rest of the country could not be investigated. Although the fragile world in which the *kasipu* consumer is situated can easily lead to suicide, access to toxic pesticides in the wetland is more limited than in the predominantly agricultural areas.

Alcohol and gender

In western society, public consumption of alcoholic beverages is highly regulated, both legally and culturally. According to Joffe (1998), socialising involves a higher than normal level of assertiveness on the part of males and females, and this situation is chemically facilitated by the use of alcohol. Alcohol is often indispensable in both small- and large-scale rituals of male solidarity. Alcohol fuels different types and levels of bonding activities that help shape male interpersonal relations and contribute to cultural maintenance. Women are often absent from these situations except as facilitators of consumption or as objects of desire. In Sri Lanka, there never was a tradition for women to consume alcohol and in most parts of the country this is still the case. In the IWMI study (forthcoming), all of the 32 percent of people under the influence of alcohol at the time of self-poisoning were men.

Suicide statistics in Sri Lanka reveal that the rate for males is about twice as high as that for females, but both male and female rates showed a similar pattern of increase (Silva and Pushpakumara 1996). This also corresponds with the consumption of alcohol in the wetland, which is far higher for men than for women. Many women in the wetland have to deal with an alcoholic husband, who may indulge in domestic violence and even insult passers-by. While the first is a threat to the women's personal integrity and well-being, the latter is harmful to their social relations and standing in the community (social capital). The men drink *kasipu* not only because they are bored and want to escape from the harsh realities of life, but also because drinking is a social event for them. The wives of drinking husbands, however, are deprived from socialising with other people and remain with less money to spend on household necessities. With an alcoholic household head who frequently uses bad language, the wife and other household members are stigmatised. In another area of Sri Lanka (Mahaweli), many women went to the Middle East because their husbands had abused them while being under the influence of alcohol. Others had committed suicide. De Zoysa (1995) points out that, in Sinhala culture, daughters are rarely beaten, but sons are often punished prior to puberty to instil discipline. In adulthood, these boys are more easily inclined to beat up their own wives and sons.

What can be done to change the situation of the households in the wetland in general and of the women in particular? Existing regulations could be better observed, laws enforced and illegal networks should be eradicated. Restricting the influence of the quasi-supporting networks (see Table 14.1) is difficult as the government collects a considerable amount of tax money from networks that produce alcohol and tobacco. But it is evident that much of the alcohol consumed in many areas of Sri Lanka is illegal alcohol (*kasipu*). *Kasipu* has approximately 30 percent alcohol content and should be regarded as hard liquor. Several NGOs, such as Sumithrayo, work in the area of alcohol abuse and drug addiction but there are too few trained persons in the villages to solve the problem. Even if there were, the underlying causes of poverty, illegal residence, and unemployment still need to be addressed. The following case shows how women in India, with the assistance of a supporting network, tackle alcoholism in their community.

Andhra Pradesh became a 'dry' state in December 1994. The decision to ban the scale of alcohol follows a campaign by village women who were fed up with husbands drinking away the housekeeping money. Their movement was so strong that the local party won a victory by promising to introduce prohibition. The temperance movement began in 1992 with at times violent anti-booze demonstrations by women against shops selling *arak* (a popular liquor in India). Shops were set ablaze, liquor trucks ambushed and, as the movement gained power, mobs of women stormed bars or went on cleaning and cooking strikes. Andhra Pradesh is now one of two Indian states (the other is Gujarat) which has prohibition (Finlay et al. 1996).

It is obvious that alcohol addiction is a severe burden to the household economy. In the case of Andra Pradesh, the situation improved and changed households' livelihoods from insecure to more secure. It shows that the best results are obtained when the problems are solved with solutions brought forward by the community itself.

14.3 Livelihood and health

An important element in the theoretical framework of this study is the distinction between *emic* and *etic*. In countries where adequate healthcare is not available and the choice of services restricted, folk medicine is important. It is based on the logic-empirical distinctions regarding health and illness of the people themselves and is part of their culture. As such, it is an emic system. Modern health care with its scientific base can be referred to as etic. In the wetland, healthcare appears to have both emic and etic components. However, emic and etic should not be contrasted as two totally different categories. I agree with Niehof (1999) that the strength of the concepts lies in its complementarity. The use of an anthropological tool such as the emic-etic distinction is important for a better understanding of the relations and practices of familial, communal and social institutions. It also sheds light on a range of inter-institutional relationships that are relevant to assessing people's livelihood strategies. Table 14.2 shows the health section of the matrix on emic and etic that was introduced in Chapter 4. It is reproduced here to understand the discussion about the relations and differences between the two concepts.

Table 14.2 Emic and etic in relation to health

Emic (folk-sector) *Main study area of anthropology.*	Culture-bound interactions and context. *Interdisciplinary translation.*	**Etic** (professional sector) *Main study area of biomedical and natural science.*
<u>*Illness*</u> (Actors' perception) Logic-empirical causes: - Body imbalance - Error - Sin - Fate - Cosmology	(Medical) Institutional Networks. Social relationships: - Households - Family - Community	<u>*Disease*</u> (Universal claims) Scientific causes: - Germs - Trauma - Psychological
<u>*Healing*</u> - Folk-medicine - Non-professional - Healer	Choices and decisions. Strategies.	<u>*Curing*</u> - Technical science - Biomedicine - Health care

The emic and etic distinction can also be applied to the household production of health framework (HHPH). Emic views on health, hygiene and proper diet are different in every culture. The perspective the wetland inhabitants have on the household production of health (emic view), and the way they actually behave, form a complex whole. In their article, Berman et al. (1994) state that health-producing behaviours are not necessarily carried out with explicit links to health in mind. A framework is created in Table 14.3 in which the emic-etic distinction is applied to the HHPH framework. Examples from this research are given for each category.

Table 14.3 Health behaviour and its impact in relation to emic and etic

	Unintended health behaviour (emic viewpoint)	**Intended health behaviour (emic viewpoint)**
No measurable impact on health (etic measurement)	**A** • Not relevant in the context of this research as it concerns all actions in life carried out without health in mind and not having an impact on one's health.	**C** • Consulting an exorcist. • A thread around the wrist for protection against diseases. • The dot on a child's forehead to protect it from evil eyes. • A prayer for safe return before going out in a fishing boat. • Counting the number of buckets of water used during a bath. • Eating baby shark meat to enhance fertility.
Measurable impact on health (etic measurement)	**B** • The use of mosquito nets and coil rings because they are mainly used to avoid the nuisance of mosquito bites. • Eating variable foods because of the different tastes.	**D** • Vaccination. • Consumption of fruits. • Boiling drinking water. • Taking a complete bath to prevent fever. • Not drinking milk or eating mango to prevent worms .

In the household production of health framework we looked at health beliefs and practices of the households in the wetland. Health-seeking behaviour, hygiene practices and diet are influenced by experience and emic views, as well as by the norms set by family members, medical practitioners and the wider society that reflect religion and cultural beliefs. Sachs (1989) is of the opinion that in Sri Lanka people seem to have realistic expectations as to what biomedical care can do in relation to other options. The caste system and the overall asymmetry of power relations have the effect that poor people adjust their expectations to fit their subordinate position. The wetland inhabitants use and interpret what they get in the context of their overall world of ideas built on experiences.

In the marsh part of the wetland, people do not feel they are more prone to diseases than people living outside the swamp. More often than not, the inhabitants think that the area they live in is less disease-prone than the urban areas surrounding it. The old western view of

marshes as disease-infested areas as described in Giblett's book (1996) applies more to the lagoon people than to the marsh dwellers. The black-polluted waters with millions of breeding mosquitoes are located right behind the lagoon dwellings. The smell that rises from the bog is not that of rotting vegetation, but of rotting fish-waste and garbage. We saw in Chapter 11 that, fortunately, the wetland is not situated in a dengue- or malaria-infested area but just bordering on it. While for Colombo and other urban areas an increasing number of dengue cases is reported, Muthurajawela is still relatively free from this mosquito-transmitted disease. The same applies for malaria. Working alone, without the assistance of a medical research team, it was not possible for me to assess the actual health status of the residents in the wetland and compare it to people living outside the wetland.

Disease prevention and hygiene behaviour

Perceptions of disease prevention and hygiene behaviour are the result of the individual's experiences and influences from the wider society. Nielsen et al. (2001) found that in Pakistan, the understanding of contamination was mainly related to visible pollution and dirt and not to the actual presence of germs or bacteria. In the wetland, the understanding of the aetiology of diseases that are not perceived as a serious threat, such as leptospirosis, diarrhoea and worm infection, is low. In the past, when more people were involved in digging up peat and had to wade through the marsh water for many hours, small epidemics of leptospirosis used to occur. However, as we saw in Chapter 11, the number of patients with this disease is rapidly increasing.

Answering the question about common diseases in the area, people tended to mention those that they had recently been confronted with or heard about recently. Various explanations for these diseases were given. An explanation such as, "consuming water cress (*kankun*) in the rainy season can make you sick", is not so unrealistic as it seems. Peters and Gilles (1997) mention watercress a source of infection of (liver) fluke (*fascioliasis*), especially wild watercress that grows commonly in swampy areas. Two million people world-wide are believed to be infected. Also the (emic) statement that "worms can bite in your heart" is not so strange if one knows that filariasis is endemic in the coastal belt of the island, and several cases of infection with dirofilaria, the common dog heartworm, have been recorded in humans in Sri Lanka. Medical research would be needed to understand the causes of symptoms that many people in the wetland suffer from, such as joint-pains and cough-and-cold.

According to Curtis (1998), hygiene behaviour originates from the need for individual and social order, because order is thought to stimulate harmony and health. Hygiene practices are also important because they enhance self-respect and dignity. The marsh women have to take a complete bath, involving a certain number of buckets poured out over the head, in order to be really clean and, in their eyes, to prevent them from falling ill. Other customary practices to prevent disease are a string around the waist or pulse and the *pottuwa*, the dark dot between a child's eyes. Curtis (1998: 5) postulates that "if there is now a general consensus that safer hygiene can play a major rule in the prevention of […] diseases, there is, as yet, no consensus on what practices present a risk to health or about how to go about changing these practices." It is clear that some deep-rooted beliefs and practices are difficult to influence. Furthermore, deep-rooted practices that have a negative impact on hygiene and health, but are not perceived as such by the people themselves, are even more difficult to change. Even if negative impacts can be demonstrated by science, it will require formulating the links between beliefs, practices and health impacts in emic terms to convince people about the importance of changing their behaviour.

(Mal)Nutrition

Anthropometric survey data collected in the Uva province in 1994 showed that 29 percent of the children under five years of age were stunted (too short), while the prevalence of wasting (too thin) was 20 percent. Of the adult population, 85 percent of the parents were classified as undernourished based on the Body Mass Index (BMI). In Gampaha, the district where Muthurajawela is located, the percentage of underweight children between the age of 3 and 5 years was 42 percent in 1993, which was the highest percentage compared to six other districts. In 1994 this was reduced to 26 percent (UNICEF 1995). A more recent study among school-going children (grade 1-5) carried out in the dry zone of Sri Lanka by Fernando et al. (2000), showed that around two-thirds of children were found to have a low weight for their age or height. One-fifth were moderately stunted and 50 percent were wasted. Because the study was done after the failure of crops due to drought, the results suggest that the children experienced acute seasonal under-nutrition. A noteworthy outcome of the study was that boys were significantly more undernourished than girls, which could not be explained.

Poverty is a major factor in household food security and family nutrition. The data of a household survey carried out in the Kandy and Badulla districts were analysed to ascertain causes of malnutrition. The statistical results show that malnutrition in children does not depend on income-related variables. Malnutrition was prevalent even among the children from households with relatively higher incomes (Sedere 1998). The absence of a direct correlation between household income and nutrition is also apparent in Muthurajawela, where the children from the poor households do not seem to suffer from malnutrition. As is shown in models depicting causes of malnutrition (e.g. UNICEF 1990), dietary intake and nutritional status are dependent upon several factors, not just the availability of food. Ways of food preparation and eating habits are also important in this respect. People in Sri Lanka often start the preparation of the evening meal in the morning and the food is cooked for hours, causing vital vitamins to be lost by overcooking. Cultural habits prevent some households from taking adequate nourishment. In the wetland households, the scarcity of wood fuel and the lack of money to buy fuel sources (wood or gas) prevent the food from being overcooked. Another factor contributing to the reasonable nutritional situation of the marsh inhabitants might be that the people are predominantly Catholic and do not have food prohibitions. Many people in Sri Lanka from other religious denominations do not eat eggs, meat, fish or poultry for religious reasons.

Ayurveda

In Sri Lanka, ayurvedic medicine is not just a system of medical practice but includes references to the elements of the universe, rituals, and the classification of ‘hot’ and ‘cold’. People in the wetland also categorise diseases, food, and medicines into having hot and cold properties. According to Nichter (1987), bathing and food consumption in Sinhalese culture are activities in which the balancing of hot and cold aspects plays a prominent role. For vulnerable groups like children and pregnant women, balancing hot and cold is particularly important. Alter (1999: S47) remarks the following about pregnancy and birth as seen from an ayurveda perspective: “It is not so much that pregnancy is classified, or misclassified, as a medical problem and the mother ‘treated’ for her ‘condition’ as that birth itself is somewhat pathogenic insofar as it triggers imbalance.”

Obeyesekere (1976) has described how concepts of ayurveda help create syndromes that are culturally defined. One example is related to phlegm and is concentrated in the head. The head should be especially protected against rain. Ayurvedic theory explains that negligence in protecting the head from cold causes an excess of phlegm, which may make people vulnerable

to colds and other diseases. Also the wetland people, if they have no umbrella, cover their head with a handkerchief or a bag as soon as it starts drizzling. Of the same order is the preoccupation with the right number of buckets used for bathing in order to avoid specific diseases. These concerns, along with environmental conditions, create a culturally defined disease complex that may work as a self-fulfilling prophecy. It is therefore also difficult to judge whether healing sessions (*tovil*) indeed have an impact on a person's health. If an individual strongly believes that a healing performance will help him or her, it may well have that effect.

14.4 Livelihood and natural resources

Human interventions have had a strong influence on all of the earth's ecosystems. The question of whether an environmental crisis exists or not is still debated. Over the past few centuries, there were many attempts in reclaiming Muthurajawela marsh to make it suitable for rice cultivation. These attempts were not successful. The population increase in the second half of the 20th century, in combination with rapid economic development and particular water management practices, were crucial in determining Muthurajawela's future. The wetland has been subject to integrated conservation and development planning since 1989. Nature conservation and human development, however, sometimes seem incompatible and even mutually exclusive. This is because conservation aims at more long-term sustainable benefits, whereas human development is generally concerned with short-term needs. Hence, the concept of sustainable development evolved, which aims to combine them. The notions of biodiversity and sustainable development are both of recent date. The term 'sustainable development' was used by the Brundtland Commission in 1987, and the term 'biodiversity' stems from the same period (Herfkens 2002). However, it was Erik Eckholm who, already in 1982, stressed the links between the fate of the poor and the fate of nature in his book "Down to Earth." He argued that responses to environmental threats can be formulated only in relation to broader human goals. The issue is not whether societies can adapt to further environmental degradation, but what the price of doing so will be.

Table 14.4 shows a section of the matrix introduced in Chapter 4. It illustrates the connections between the concepts relating to livelihood and environment, used in this thesis. It also facilitates to understand the discussion on the outcomes of the livelihood strategies from the point of view of the wetland dwellers and that of the environmentalists.

Table 14.4 Livelihood and environment in relation to emic and etic

Emic (folk-sector) *Main study area of anthropology*	Culture-bound interactions and context *Interdisciplinary translation*	**Etic** (professional sector) *Main study area of biomedical and natural science*
Livelihood strategies; from the native's point of view	*Environmental problems & livelihood vulnerability*	*Strategies by environmentalists; from nature's point of view*
Coping	Deforestation	Balancing the ecosystem
Surviving	Population pressure	Conservation of nature
Maximising	Natural disasters	Clean air, water, soil
Personal development	Health hazards	Environmental protection

So far, the emic-etic distinction has been primarily used by (medical) anthropologists, but other social sciences could benefit from this distinction as well. Using an emic perspective and taking the point of view of the target group into account can lead to a more complete and holistic picture of the topic studied.

To strengthen the livelihood of the people in the wetland, income-generating activities were initiated. The term 'beneficiary' is still used for men and women involved in such projects, which seems to indicate a lack of a business-oriented approach. In its participatory projects, the UNDP sees human beings, with their freedom and ability to choose, as 'actors' rather than as 'beneficiaries' (UNCDF 2000). In this thesis, the terms 'client' or 'participant' are used. 'Stakeholder' is the general term for those people, institutions or organisations that are related to or affected by policies and interventions. However, in conservation projects not only the terminology but also the concept of co-management needs attention.

There is little evidence from Sri Lanka or elsewhere that income-generating projects result in a long-lasting reduction of the pressure on wetland resources. Such income-generating activities are often done on a part-time basis and carried out by only a small number of participants. Often, the activities carried out do not relate to existing traditions, while fishermen usually have a strong traditional tie with their profession. On the basis of their research on participation in natural resource management at Chilaw Lagoon just 40 km north of Negombo, Foell et al. (2000) observe that participatory approaches usually elicit the participation of the most visible and powerful. They argue that participatory approaches are not necessarily the most appropriate or efficient management tools for resolving coastal zone management issues.

Fishing-families in the wetland rely more directly on the natural resources of the wetland for their livelihood than other families do. The Ramsar concept of 'conservation through wise use' is particularly relevant to the fishermen in the northern part of the wetland and to some groups living inside the marsh who are dependent on the wetland resources. According to Kumaradasa et al. (2001), the best strategy is to link the fishermen's livelihood with sustainable use of the wetland resources. If dependency on the resources is only partial or indirect, providing job opportunities for economic substitution is considered a better strategy. Conservation strategies, in order to be effective, must take into account the degree to which the natural resources concerned are threatened. This requires a ranking of threats and applying a technique called 'Threat Reduction Assessment Index'. It is beyond the scope of this thesis to discuss this technique here.

In Muthurajawela, the feasibility of the different income-generating pilot projects for the local people have been evaluated to see whether they are sustainable, and whether they are suitable for replication elsewhere. An important assumption was that only if the inhabitants of the wetland experience real gains from resource management, are they likely to increase their engagement in it. Similar is the assumption of Starkloff (1998), who did a study on land use in Uva, a highland province in Sri Lanka. There, the farmers are negatively affected by the way they till their land. Their major complaint is that there is too much water in the rainy season and too little in the dry season. Starkloff (1998: 929) states that "Integrated […] management strategy would have to convince farmers that their economic survival will be maintained by adopting environmental sound techniques and products." The assumption that community development and socio-economic improvement will lead to improved resource management has, according a NAREPP report (1996), not been validated by experience. The Brundtland imperative, which holds that economic growth and environmental conservation

should be compatible objectives, is still rarely realised according to Starkloff. However, it is believed, that the co-management approach is viable and that it is necessary for sustainable management of some of Sri Lanka's natural resources. Salafsky and Wollenberg (2000: 1436) conclude "that there is no one strategy that works everywhere and indeed, probably no one strategy that can work on its own at any given site." In parts of Africa, more and more people depend on wetlands for their livelihoods. Small inland wetlands allow farmers to grow vegetables and other crops in both the rainy and dry season, which is vital to household nutrition and incomes (IWMI 2002). The saline waters of Muthurajawela hampers the inhabitants from getting involved in profitable agriculture. Indeed, the choice of a conservation strategy is not an either/or question, but rather a matter of fitting the right combination of strategies to the conditions at hand.

Women and environment

Since 1980, efforts have been made to study the impact of environmental degradation, particularly on women. In the seventies, the term eco-feminism had been coined by women who revolted against those activities that caused deterioration of the environment and the influence this had on their livelihoods. One such non-violent clash took place in India's Himalayas, where women resisted the exploitation of their forest. They were called the Chipco movement. Later, they also came into action for the conservation of water, and in 1984 to stop the exploitation of limestone (Shiva 1986). Although the example is somewhat dated, the lesson learned from the Chipco women is that while they were the worst victims of environmental destruction, they were also the best protectors of that environment. Other examples of lessons learned, although not exclusively concerning women, are eco-tourism projects, such as the Annapurna project in Nepal.

Plans for nature conservation and development management will have to take strategic and practical gender needs into account. This implies looking at the situation of both women and men, and at their specific needs. The deterioration of the environment is perhaps of more immediate concern to women than to men. Women have to walk further to seek firewood needed for the household, which increases their burden. It has become clear that the pilot projects carried out in the wetland to generate income were expensive to run and had little positive impact on the environment and the women concerned. Finding solutions that lead to successful conservation management and are gender sensitive remains a challenging task.

The role of women in most community activities is crucial, and women are often the first to be affected by environmental degradation. Therefore, it is women who most readily take the initiative in setting up credit groups, and who demand better health and family planning services. Because of their responsibility for family welfare, they are more likely to see the need for a change of behaviour. In some societies, women are kept apart from the world of men and suffer from very strict controls. This is not the case in the wetland. However, outward appearances can also be deceptive in the wetland. As Foell et al. (2000) emphasise, intra-household tensions and conflicts are usually hidden from view. In the wetland, women are burdened with problems ensuing from poverty, environmental degradation and alcohol abuse, which are not visible at first sight. In this thesis I have tried to bring these problems to the surface.

14.5 The future of Muthurajawela

Poor people are generally powerless, and they tend to adapt to rather than resist social or environmental changes that carry negative implications for their health and livelihoods. What

are the conditions that allow some communities to survive while others perish? Life for many poor people consists of suffering and grief. According to Elsass (1992), the display of grief and anxiety among Shiite Muslims is part of their religion and a sign of deep understanding. In contrast, the people of Bali or the Thai-Lao people regard showing of emotions to be disgraceful. The flattening of emotions is for them an important way to maintain a stable and harmonious inner life. A Buddhist would say that hopelessness is one's fate, and salvation lies in understanding and living through this hopelessness. This attitude can also be found among the inhabitants of Muthurajawela, although they are predominantly Roman Catholic. In general, they seem to feel at peace and want to stay in the wetland. They put their hardships into perspective and belief that the difficult situations they experience are part of their fate. Their sense of relativism is an important survival skill.

Many marsh dwellers are facing an uncertain future with the new Colombo-Katunayake highway being constructed through the marsh. Communicable diseases such as dengue and malaria could make their entrance if the area becomes urbanised. The wetland ecosystem could be destroyed by over-development. Some inhabitants will be pleased with the improved infrastructure, the increasing number of facilities and the new business opportunities. According to recent reports, the sand dredging needed for the construction of the expressway has severely affected the livelihood of thousands of fishermen. It has destroyed the breeding grounds of fish in shallow waters. During a peaceful protest against the highway project, three demonstrators were killed when police opened fire (Milieudefensie 2002).

A major challenge in natural resource management for sustainable use is to find a balance between etic indicators relevant and visible to outsiders (wetland managers, scientists, government planners) and indicators that make sense to local people (emic indicators). Building on local perceptions and giving decision-making power to the participants in the economic substitution projects can stimulate positive interaction between livelihood and nature. These are important steps in achieving integrated resources management.

It is still too early to describe the final impact of the highway, the construction of which has recently begun. The prospect that Sri Lanka's first highway is being constructed through a wetland is, however, rather alarming. The tensions between the views of the nature conservation activists, the interests of the local communities, and the economic interest of the government will increase. The marsh people will most probably adjust themselves to the changes in their habitat over time. They will do what they think they have to do, in order to survive.

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Glossary

Cadjan	Palm-leaves
CEA	Central Environmental Authority
Emic	Insider's view
Etic	Outsider's view
Fetish	Object with supernatural powers
GIS	Geographical Information System
GNP	Gross National Product
HHPH	Household Production of Health
IDS	Institute of Development Studies
IRMP	Integrated Resources Management Program in Wetlands
JE	Japanese encephalitis
JVP	Janatha Vimukthi Peramuna (Sinhalese movement)
Kasipu	Illegally brewed alcohol
Katadiya	Exorcist
KFA	Kattudel (stake-net) Fishery Association
Lakh	100,000 Sri Lankan rupees
LTTE	Liberation Tigers of Tamil Eelam
MOH	Ministry of Health
MRI	Medical Research Institute
Mudaliyar	Chief administrator
NGO	Non Governmental Organisation
One US $	About 75 rupees (1999)
OPD	Out-patient department
Oya	River
PA	People Alliance
Padu	Personal fishing location in the lagoon
Ramsar	Place in Iran, where the convention on wetlands was adopted
Ruwal oru	Large sailing canoe with a brown sail
SLFP	Sri Lanka Freedom Party
String hoppers	Noodles
Tovil	Healing session through exorcism
UNFPA	United Nations Fund for Population Activities
UNICEF	United Nations Children Fund
UNP	United National Party
WCP	Wetland Conservation Project

Appendices

Appendix 1 Types of wetlands in Sri Lanka

In Sri Lanka, 22 different types of wetlands are identified, some of which are artificial:

1.	Shallow sea bays and straits	Weligama Bay
2.	Estuaries, especially barrier-built estuaries	Negombo Lagoon
3.	Small offshore island	Pigeon Island
4.	Rocky seashore	Tangalle, Beruwela
5.	Sandy sea beaches	Most of the coastline in Sri Lanka
6.	Inter-tidal mud flats	Lagoons, estuaries and river mouths
7.	Mangrove swamps	Lagoons, estuaries and river mouths
8.	Coastal brackish lagoons	Rekawa and Mundel lagoon
9.	Salt pans	Maha Lewaya, Hambantota
10.	Shrimp ponds	North-Western Province
11.	Rivers, streams – slow flowing	Any river or stream
12.	Rivers, streams – fast flowing	High located parts of rivers, streams
13.	Riverine marshes	Villus from Mahaweli Ganga
14.	Freshwater irrigation tanks	There are thousands in Sri Lanka
15.	Freshwater ponds and swamps	Mahawewa
16.	Inland drainage systems	Bellanwila-Attidiya
17.	Water storage reservoirs, dams	Victoria dam and reservoir
18.	Seasonally flooded grassland	Mahaweli floodplain
19.	Rice paddies	Throughout the country
20.	Flooded arable land	Irrigated land
21.	Swamp forest	Waturana
22.	Peat bogs	Muthurajawela

Appendix 2 Parties in Sri Lanka involved in managing wetlands

An important result of the wetland conservation project was the establishment of the national wetland steering committee (NWSC). This committee is mandated to co-ordinate all activities with respect to wetlands in Sri Lanka. The most relevant members of this steering committee are presented below beginning with the Central Environmental Authority (CEA), which remains the day-to-day executive agency.

The Central Environmental Authority
In 1981, the CEA was set up in order to guide and co-ordinate the growing environmental activities in Sri Lanka. The CEA consists of representatives from the government, from NGOs and experts. It has the power to implement and enforce environmental programs for the protection and management of the environment.

Sri Lanka land reclamation and development corporation (SLLRDC)
Initially, the main objective of the corporation was to reclaim and develop marshy land. At present, the focus is also on the maintenance and improvement of canals. The main source of income is through the filling and selling of land. The organisation has been involved in all the zones of Muthurajawela and is in charge of dredging the area.

Ministry of fisheries and aquatic resources development
The objective of the ministry is to increase the per capita production and consumption of fishery-products and, indirectly, to improve the standard of living of the fisher-communities. District officers and fishery inspectors verify whether regulations are followed and also act as a sort of welfare worker. The ministry tries to manage pollution and over-fishing in the Negombo Lagoon and at sea. The ministry supports the conservation management plan because it contributes to saving the ecosystem and thereby the fishery industry.

Board of investment (BOI)
The board (BOI was formerly called Greater Colombo Economic Commission) was set up to deal with unemployment problems in Sri Lanka by stimulating the economical development through industrialisation and by attracting investors. The BOI has been involved in the preparation of the master plan. It focusses on improving the local people's livelihood by creating jobs and improving the infrastructure in the area.

The urban development authority (UDA)
The UDA promotes economical and social development for better utilisation of certain areas. The authority is represented in the Muthurajawela management committee but delegates most of its powers to other agencies. UDA is preparing a plan for the Colombo metropolitan region. The authority does not foresee that the expansion of Colombo will cause a serious threat to the wetland area since the idea is to expand the urban population more towards the south and east of the capital.

National housing development authority (NHDA)
The NHDA provides small loans to people from low income groups to construct houses and give technical guidance. The authority assists in the upgrading of existing houses or, if that is not possible, help relocate people. The authority, in co-operation with Muthurajawela United

People's Organisation (MUPO) among others, has been involved in the resettlement program of Awarakatuwa in the mixed urban zone of the wetland.

Department of forestry (DF)
The department of forestry was established in 1887. At first it was more production and export trade oriented, but since 1995 the department's main policy is to conserve forest. DF is involved in mangrove management and is dependent on foreign funding for their activities.

Department of wildlife conservation (DWLC)
This department was established in 1938 in order to exploit the fauna and flora resources of Sri Lanka. In 1950 the objective changed to conservation. The DWLC is the country's representative in enacting the Ramsar convention. There are different categories of protected areas. The category with the highest protection priority is the strict nature reserve, without exploitation possibilities, and focusing on conservation and scientific research. The second category is the nature reserves. Here people can be given permission to cultivate inherited areas at a small scale. The third category are the national parks which are common in Sri Lanka and which can be visited by people to see the flora and fauna. The last category, under which Muthurajawela falls, are sanctuaries. Sanctuary land can be privately owned. In the other categories, all land is state land. Certain activities are prohibited in the state lands as well as the private lands, like poaching, and hunting. Clearing land for construction purposes is only prohibited in a sanctuary on state land.

Divisional secretariats
The divisional secretariat division (DSD) is an institutional mechanism for the delegation of administrative power. The head is the divisional secretary. Land allocation and issuing land-deeds for instance for the people in the relocation area is the responsibility of the DSD. The Muthurajawela-Negombo area is situated in four different DSDs, Negombo, Katana, Ja-Ela and Wattala. The urban council, the divisional secretary and a member of parliament (MP) meet monthly to discuss the situation in the area and the allocation of funds. The divisional secretary is hierarchically above the urban council (an elected agency) whose planning the DSD has to approve. The person's main influence is through finances and in approving the allocation of funds. The DSD can take action if illegal encroachment is reported by sending police to evacuate the people and to demolish buildings in the area. The member of parliament is also an elected person who bears responsibility to the parliament. The MP uses the DSD to allocate funds to invest in the area.

Appendix 3 NGOs in Muthurajawela Wetland

The national wetland steering committee (NWSC) established five working groups (WG) that are involved in: monitoring and evaluation, public awareness, legislation, Ramsar, and Bellanwila-Attidiya wetland. Apart from the governmental organisations, some non-governmental organisations also play an important role.

NGOs in the marsh area

Janodaya and the Muthurajawela United People's Organisation (MUPO)

When the first squatters came to Muthurajawela in 1973, they settled along the existing roads, canal or river. For security they settled near each other. Being poor, illegal inhabitants in the middle of a marshland were dealing with many different problems. A former priest of the village Uswatekaiyawa took the initiative to form a so-called animating team (Janodaya) in order to make the people aware of their situation, to organise themselves and to motivate them to improve their living conditions. In 1987, basic groups were united in the MUPO. The goal of this NGO is to organise the people who are living in Muthurajawela or who are dependant on the marshland, and to improve their living conditions. The MUPO consists of these basic groups and the animating team Janodaya.

At present there are five types of basic groups:
- Muthurajawela squatter groups
- Fishermen groups
- Women groups
- Youth and children groups
- Janodaya family group

In every basic group ten persons are trained by the Janodaya team to take care of aspects such as, health, income generation, community management, how to run a mini bank in which money can be saved for communal facilities, and juridical affairs. The emphasis is put on self-reliance in running MUPO.

NGOs in the Negombo Lagoon area

There are several NGOs in the Negombo Lagoon area. Most of them represent a group of fishermen in the area. Since there are many different groups of fishermen (different villages, fishing territories and fishing methods) it is impossible to unite the groups in one NGO.

The Negombo Lagoon United Fishermen Organisation (NLUFO)

This NGO was established in 1974 to solve disputes between fishermen over fishing methods. Different types of fishermen are united in this NGO so it does not exclusively aim at a specific village or group. The objective is to protect the environment and to harmonise and support the different groups of fishermen living around the Negombo Lagoon. There are 2800 people from around the lagoon, all of whom are members of NLUFO, 90% male and 10% female. The funds come from different organisations and partly from the members themselves, who pay 5 rupees a month.

The Negombo United Peoples Organisation (NUPO)

NUPO was established in 1997 and was created because of discontent with the present political, religious and educational system. NUPO focuses on the Negombo residence area just north of the lagoon, but has not been active in preparing the master plan.

Fishermen's Solidarity Committee (*FSC)*
This NGO is a split-off from SEDEC (the fishermen's platform) (see below). This organisation also represents the Negombo fishermen.

National NGOs involved in Muthurajawela
At the national level, several NGOs have been involved in the area or parts of the area. The most important national NGOs are discussed in this section.

SEDEC
The implementation instrument of the Catholic Church is SEDEC. The church has helped the poor for many decades with funds for land and houses (Oltman and Schut 1998). SEDEC is involved in projects on human development. The funds come from Catholic funding agencies like Cebemo and the Asian Partnership for Human Development. For every ten Catholic dioceses in Sri Lanka, there is one director. These directors form the policy making body. The national director receives the different program proposals and discusses whether or not to approve them with the head of divisions.

Centre for Society and Religion (CSR)
The CSR is an independent NGO, mainly Catholic but there are also people from other religions. The six main fields of interest of the CSR are: women, human rights, environment, publications, theology and seminars. The seminars are about policy, democracy, government, women's affairs and globalisation.

CAPRA
This national NGO has the objective to empower communities through workshops and community-based activities with the community action planning (CAP) methodology. They also teach communities how to deal with government agencies. In the CAP approach, the people are in the centre and the government plays only a supporting role.

Appendix 4 Survival survey questionnaire

(for women) *HH No* ___

Fill, tick or encircle the right answer. **More answers are sometimes possible.**

Village name _____ Name of family _____

Age ____

Marital status: S M D W Children: 0 1 2 3 4 >4 __

How long do you live here? __ years. Legal or illegal? _____

1. **How would you describe your daily workload?** *A* light *B* moderate *C* busy

2. **From how many activities does this household has an income?**
   0 1 2 3 4 5

3. **Have you heard about the Muthurajawela Wetland Conservation Project?** Y N

4. **Have you heard about the visitors centre in the wetland that take schoolchildren and tourists for a boat trip through the marsh?** Y N

5. **(If 3 or 4 is yes) Do you think it is a good organisation/project?**
   Don't know __ Y N

6. **If no, why not?** Don't know __ Tourist boats destroy __ They try to push us out of the village/house __ Control us __ Other __

7. **If yes, why?** Awareness creation __ Protect the wetland __
   Involve the people who live in the marsh __ Fun for children __ Other -

8. **What are the good things you get from the wetland?**
   Nothing __ Don't know __ Food __ Firewood __ Peaceful living __
   Construction material __ Other ____

9. **What are the bad things you get by living in the wetland?**
   Don't know __ Diseases __ Floods __ Mosquito's __ Rats __
   Illegal status __ Too many people __ Saline water __ Other _____

10. **By living in a wetland, do you think people can get diseases more easy than if one lives outside the swamp?** Don't know __ Y N

11. **If yes, why?**
   More pollution __ Too many people __ Mosquito's spread diseases __
   Floods __ Diarrhoea __ Worm infection __
   Pain in joints __ Rats __ Other _____

12. **What do you do for protection against insects or diseases?**
   Nothing __ Mosquito coil __ Boiling water __ Latrine use __ Pest control __
   Proper waste disposal __ Cover foods __ Bednets for children only __

Bednets for everybody __ Other _____

13. **What are the <u>two</u> most common diseases in children in this area?**
Don't know __ Diarrhoea __ Fever __ Malaria __ Chicken pox _
Malnutrition __ Cough and cold __ Other _____

14. **What do you do with a child when it has fever?**
Home remedies __ To hospital __ To health centre __ Dispensary __
To ayurvedic __ Other _____

15. **What is the cause of fever?**
Don't know __ Mosquitos __ Bad foods/drinks __ Cold __
Floods __ Person to person __ Sun __ Other _____

16. **What are the <u>two</u> most common diseases for adults in this area?**
Don't know __ Diarrhoea __ Fever __ Headache __ Tiredness __
Joint pain __ Cough and cold __ Other _____

17. **What is the cause of diarrhoea in this area?** Don't know __
Bad water __ Bad food __ Little food __ Teething __
Person to person __ Germs __ Other __

18. **What is the ideal number of children for a family according to you?**
0 1 2 3 4 > 4 __ Don't know __

19. **Have you ever tried (or are you using) <u>modern</u> FP methods?** (Pill, Injection, IUD, Condom, Sterilisation, Other) Y N

20. **Have you ever tried (or are you using) <u>traditional</u> FP methods?** (Calendar, Billings, Withdrawal, Other) Y N

21. **Does the RC Church in this area advocate bigger families?** Don't know _ Y N

22. **Do you feel alcoholism is a problem in this area?** Y N

23. **If yes, why do people drink here so much?** I don't know __
Boredom __ It is cheap __ To forget problems __
Man feel more male __ Other __

24. **Do you feel your meals or that of your children are lacking certain foodstuffs?** Y N
25. **If yes, what foods?** _____

Appendix 5 Livelihood survey questionnaire

Fill, tick or encircle right answer. *HH No* ___
Village name _____ Full name of respondent _____ Sex __

No (1)	First name hh member (2)	sex (3)	age (4)	Marit. Status (5)	Relat.to hh head (6)	Educ Level (7)	Profes-sion (8)	*Personal Savings (9)*	*Income from activities (10)*	*Personal Assets or Stocks (11)*	*Outstan-ding money (12)*
1	Head of Househ.							Rs.	Rupees Per month Rs._____	Underline below for Head of household	Rs.
2											
3											
4											
5											
6											
7											
8											
9											
10											

(1) Household head gets number 1.
(2) Fill in the first names of the household members
(3) **M**=male, **F**=female
(4) Age
(5) **S**=single, **M**=married, **Sep**=separated, **W**=widowed
(6) **Sp**=spouse, **C**=child, **G**=grandchild, **P**=parent, **O**=other Kin, **NK**=no Kin
(7) No of years 0-8, O/L = 9+10, A/L = 11+12, **V**=vocational school.
(8) **NA**=not applicable, **F**=fisherman, **L** =labourer, **Ind** = Industry **T**=Trader, **D**=Driver, **O**=Other
(9) Amount of Rupees in cash; Amount of rupees in bank
(10) Income from small jobs in Rs per months [average].
(11) **Underline items for head of household**. House, Land, Boat, Fishing gear, TV, Radio, Fridge, Fan, Sewing machine, Pushbike, Motorbike, Cart, Livestock, Jewellery, Others _____
(12) Money lend to others

1. **Who is deciding on what to spend the money on?** Man __ Wife __ Both ____
Others _____

2. **If you were going to move to another place, for how much could you sell the house?** Rs. _____ I don't know __ Selling not possible __ (Why not?)

3. **When it rains hard and the area gets flooded, is that a stressful situation for you and the other household members?** Y N **If yes, why?**
We cannot go to work ___ Children cannot go to school __
We need transport over water __ We cannot cook__ Cooking is difficult __
House gets flooded __ House gets damaged __
Reptiles are coming ___ Other explanations _____

4. **Do you take arrangements or precautions for the household to be prepared for periods of flood?** Y N **If yes, which ones?**
We arrange to stay in the church _____ We prepare to stay with relatives _
Buy extra food before the floods come___ Bring children to relative _____
Buy food which does not need cooking __ Keep more drinking water in stock_
Bring the animals to a safe place ____ Put household items on top of furniture
__ We prepare to go to common hall __ Other _____

5. **Do you and the other family members eat less during floods?** Y N
If yes, why? Transport problem __ Market / shops closed __
Cooking not possible __ You get sick when you go shopping during floods __
Other _____

6. **Who is helping this household in difficult times?** *(institutes, groups and persons from outside this household)* Nobody __ I don't know __
Family __ Neighbours __ Friends __ Church __ NGO (name) _____
Urban Council __ Grama Seveca ___ Other _____

7. **In what way do they help you?** _____

8. **When you are in need of money, what is the first thing you would do?**
Buy items on credit __ Borrow money from family___
Borrow money from relative ___ Borrow money from money lender ___
Borrow money from bank ___ Bring jewellery to pawnshop_____
Other_____

9. **If that does not work out or the money is not enough, what would you do second?**
Buy items on credit __ Borrow money from family___
Borrow money from relative ___ Borrow money from money lender ___
Borrow money from bank ___ Bring jewellery to pawnshop_____
Other_____

10. **Do you first discuss this with your partner?** Y N No partner

11. **What do you tell your children they should do to avoid being poor when they are older?** Nothing ____ To learn a good job_____
To look for a good wedding partner____ To work in a foreign country _____
Not indulge in alcohol or drugs _____ Other _____

12. **Will the children find their own wedding partner or are the parents selecting a partner?** Children select self __ Parents select partner __
Whatever the situation __ Other _____
Explain _____

13. **When you look at the past six / seven years, has life improved for you in general or deteriorated?** It is the same __ Improved __ Deteriorated __
In what way? _____

14. **What do you think you will have attained for this household in five years time?**
_____

15. **How do you think to achieve that; what do you do?** _____

16. **Does this household owe money to shops, the bank or others right now?** Y N
If yes, how much to: Relatives? Rs._____ Shops? Rs _____
Bank? Rs. _____ Other _____ Rs._____

17. **Have you ever been to a pawncentre in order to get money?** Y N
If yes, how many times in the past year? 1 2 3 4 5 6 ___

18. **How many items were brought there the past year? __ Total value?** Rs. ___

19. **How many items were bought back the past year? ___ For how much?** Rs.__

20. **Do you do anything for the future of your children?** Y N [No children]
If yes, what do you do for them? Bank account ___ Good education ___
Send them for special course (name of course[s])_____
Buy jewellery for them __ Bride price (dowry) ___ Give land ___ Others ___

21. **Have there been children in this household in the past 8 years that were born alive but died before the age of 5?** Y N
If yes, what was the reason?
I don't know __ Malnutrition __ Infectious disease __ Accident __
Other _____

22. **What is done in this household to keep the members healthy?**
Nothing __ Good food __ Vaccinations __ Mosquito control __ (coil, bednet)
Good hygiene ____ Use soap __ Boiling water ____ Other _____

23. **Are the children in this household getting their vaccinations?** N
Fully vaccinated __ Partly completed _ No children __

23. **Do you think that people who live illegally in the marsh are less happy then the legal ones?** Y N **If yes, why?** They have a lower status_____
They live in uncertainty/ are scared ____ They cannot improve their house ___
They cannot sell their house ___ They do not feel the place is theirs
Other _____
Are you living here legally? Y N Don't know __

24. **[*For the marsh only*]**
How do you feel about the new highway that will be constructed through the wetland. **Are there any consequences?** Y N **If yes, in what way?**
It takes living space ___ It brings noise __ It brings pollution ___ Maybe our household has to move __ It will provide work __ It will affect the ecosystem __
What are you going to do? _____

Appendix 6 Nutrition questionnaires

Family food frequency data sheet

Family name Village Income:

Food item	Once p/day or more	Once p/week or more	About once p/month	Once or twice p/year	Never
Meat (Goat, Beef, Pork)					
Fish					
Poultry					
Liver					
Eggs					
Peas, beans, dhal, nuts					
Green leafy vegetables					
Other vegetables, Fruits					
Milk, (Yo)ghurt					
Other					

Personal data sheet for a 24 hour dietary intake

Village Name Sex Age Day of the week

Place eaten	Time	Description of food/drink	Amount

Was intake unusual in any way? Y N If yes, in what way?

Vitamin or mineral supplements taken? Y N If yes, what kind?

Multivitamin __ Iron __ Ascorbic acid __

Appendix 7 Number of hospital patients

Number of patients admitted in the three hospitals near Muthurajawela

Diseases	**Base hospital, Negombo**				**Ja-Ela hospital**				**Teaching hospital, Ragama**			
Year	1997	1998	1999	2000	1997	1998	1999	2000	1997	1998	1999	2000
Japanese encephalitis	0	1	7	12	1	1	2	_	3	3	2	3
Dengue + D. haemorrhagic fever	2	1	24	311	4	6	30	_	5	3	68	321
Leptospirosis	1	8	38	27	1	3	8	_	14	26	116	226
Malaria	490	159	101	117	20	12	40	12	157	84	203	429
Diarrhoea	986	1374	1128	987	18	45	209	202	938	426	848	939
Total. alcoh. liver disease. (death)	1174 (158)	995 (144)	840 (38)	889 (52)	_	_	28 (0)	119 (3)	297 (179)	157 (57)	867 (130)	1279 (103)

Source: hospital registers for patients admitted.

Appendix 8 The pilot projects of the IRMP

IRMP's employment/income generating pilot projects as per 30 September 2000

No	Institution/ Organisation IRMP Partnership	Income generating program	Nos. of beneficiaries (on-going projects)
A	**Private Sector**		
1	Private hatchery + 20 private out growers	Production of ornamental fish for export with use of local groundwater	20 young unemployed
2	Private persons	Production of mushrooms	2 young unemployed
3	Private persons/international firm	Export of foliage/ kaduru seeds/ coir birds	10 families
B	**Private Sector/ Samurdhi**		
4	Samurdhi Authority/ Hayleys Export Limited	Production of coir products for export	25 women
C	**Private Sector/CBO**		
5	Hayleys Export Limited/ CBO Ja-Ela Women's Group	Production of coir products for export	65 women
6	ODEL/CBO Pubudugama Women Group	Decoration of clay pots	9 women
D	**Private Sector/NGO/ Cooperative**		
7	Fishermen Cooperative/ Private Sector/ Caltex	Recycling of waste annual dump of waste engine oil from Negombo Lagoon	4 collectors
8	NGO Seth Sevana/ Private Sector Muthurajawela/ Shell	Recycling of industrial/household plastic waste in Muthurajawela	40 persons
9	Fishermen Cooperative/ Private sector/ CISIR/ VRI	Recycling of annual dump of 120,000 kgs of fish waste from Negombo Lagoon	4 collectors

Continued on the next page.

E	**Govt. Dept.-Samurdhi-NGO / CBO**		
10	Samurdhi/ Dept. Animal Production & Health/CBO	Poultry raising	38 families
11	Dept. Agricult./ Govi - Niyamaka /CBO	Home gardening	40 families
12	Dept. Animal Production & Health/CBO Tudella HDSS	Goat/pig raising	50 families
13	Samurdhi Negombo/ Laksala	Pandanus products weaving	25 women
14	FCCISL/NAITA/ Samurdhi/CBO	Organisation of job markets/job bank Muthuraja Job Agency	75 persons
15	National Craft Council/CBOs/ Schools/Samurdhi	Kaduru tree planting	many families
16	Laksala/CBO Uswetikeeiyawa	Pandanus products weaving	20 women
17	Arthacharya/Negombo Municipality	Household waste collection/ recycling/ compost making	78 families
F	**NGO/CBO/Cooperative**		
18	Negombo Fisheries Solidarity Centre	Clothes making	8 women
19	Janodaya	Home gardening	200 families
20	Laksala/ CBO	Wood carving	8 youths
21	CBO	Bee keeping	20 families
22	Negombo Lagoon Fisher People's Society/Laksala	Coconut carving	4 persons
23	Janodaya/Dept. of Health	Health/ nutrition improvement	50 families
24	CEA/The Marsh Visitor Centre	Wetland eco-tourism	20 persons

Source: IRMP Progress Report No. 11

Samenvatting

Overlevingsstrategieën van mensen in een Sri Lankaans moeras: Bestaanszekerheid, gezondheid en natuurbeheer in Muthurajawela.

Doel van de studie
Het doel van de studie was om inzicht te krijgen in hoe arme huishoudens in een moerasgebied (wetland) hun bestaanszekerheid opbouwen en handhaven en het welzijn en de gezondheid van gezinsleden trachten te bevorderen. Bestaanszekerheid is gedefinieerd als het hebben van voldoende bezittingen en andere middelen om een actief en gezond leven te leiden. In de studie is gekeken naar de hulpbronnen waar mensen over beschikken en de strategieën die ze gebruiken om te overleven, zowel in economisch opzicht als fysiek (gezondheid). Tevens is gekeken naar de bijdrage van het milieuproject dat de taak heeft het ecosysteem in het gebied te beschermen. Op grond van deze doelstelling werden de probleemstelling en onderzoeksvragen geformuleerd.

Opzet van de studie
In de studie staan de begrippen bestaanszekerheid, overlevingsstrategieën, gezondheid en ziekte centraal. Tevens wordt aandacht besteed aan de factor *gender*, de verschillende rollen en posities die mannen en vrouwen innemen om te (over)leven. Het huishouden is de eenheid van onderzoek en analyse. Het huishouden wordt niet slechts als een eenheid van consumptie gezien, maar ook als een eenheid voor huishoudelijke productie, gericht op het bereiken van bestaanszekerheid en welzijn. Op grond van dit uitgangspunt werden bepaalde theoretische kaders gebruikt. In het onderzoek werden twee perspectieven onderscheiden. Het ene is het min of meer 'objectieve' perspectief van buitenstaanders (het *etic* perspectief) om de situatie in kaart te brengen. Het andere is het 'subjectieve' perspectief dat weergeeft hoe de moerasbewoners zelf hun situatie zien (het *emic* perspectief). Er werden verschillende soorten data verzameld in het veld om de vraagstelling te beantwoorden.

Achtergrond informatie
Een groot deel van het eiland Sri Lanka bestaat uit moerasgebieden, zogenaamde wetlands, die voor verschillende doeleinden gebruikt worden. Dit kan landbouw zijn zoals de verbouwing van rijst, en verder visserij, industrie, huisvesting en in sommige gevallen dienen deze natte gebieden als toeristische trekpleister. Muthurajawela wetland ligt aan de westkust van het eiland tussen twee stedelijke gebieden in. Het bestaat voor de helft uit moerasgebied en voor de andere helft uit een lagune met een open verbinding naar de Indische Oceaan. In de opening van deze lagune liggen een aantal dicht bevolkte eilandjes, al of niet verbonden met het vaste land door een dam of brug. De onderzoeksgroep bestond uit bewoners van deze eilanden, en die van de nederzettingen in het moerasgedeelte. De meeste van deze mensen zijn uit armoede naar het natuurgebied getrokken en wonen er illegaal. De afgelopen tien jaar heeft een wetland beschermingsproject bijgedragen aan bewustwording van de ecologische problemen in het gebied en een plan geformuleerd om het wetland zo goed mogelijk te beheren. In een later stadium heeft het projectactiviteiten voor de bewoners georganiseerd om de druk op het gebied te verminderen en een verstandig gebruik van de natuurlijke bronnen te benadrukken.

Problemen in het wetland
Het ecosysteem van het gebied staat onder toenemende druk door overbevolking, met name op de eilanden in de lagune, door vervuiling van diverse aard, en door destructieve vis

methoden. De grootste problemen van de mensen zijn: armoede, alcohol verslaving, overstromingen, gezondheid risico's, gebrek aan land en illegaliteit.

Resultaten en conclusies
Hieronder zijn de onderzoeksvragen in vier clusters gegroepeerd en wordt ingegaan op de onderzoeksgegevens met betrekking tot deze vragen.

Welke bezittingen en hulpbronnen hebben de kwetsbare huishoudens in het moerasgebied, hoe worden ze gebruikt en wat zijn hierbij de verschillen tussen mannen en vrouwen?

Toename van de bevolking in het gebied vond plaats door migratie en natuurlijke aanwas, hetgeen vooral op de eilanden in de lagune tot huisvestingsproblemen leidde. Op de dichtbevolkte eilanden wonen daardoor dikwijls meerdere families in één huis. Hoewel men vaak verbeteringen aan het huisje of de hut aanbrengt, wordt de woning niet als een belangrijk bezit gezien vanwege de illegale of semi-illegale woonstatus van de bewoners. De woning kan hierdoor niet officieel verkocht worden.

Het inkomen van zowel de vissers als de andere onderzochte beroepsgroepen is onregelmatig en onzeker. Het gemiddelde inkomen in de onderzochte groep bedroeg omgerekend ongeveer € 70.- per maand. Hoewel de vissersfamilies minder verdienen, sparen zij meer. De wetlandbewoners hebben in het algemeen weinig bezit. Gouden sieraden, indien aanwezig, zijn de voornaamste bezittingen, gevolgd door radio's, fietsen en TV's. Over het algemeen worden deze goederen als het eigendom van het hoofd van de huishoudens beschouwd, behalve als het gaat om juwelen of andere artikelen die de vrouw bezat vóór de verbintenis met haar partner.

In het moeras bevinden zich een aantal illegale stokerijen die bier (*kasipu*) brouwen van goedkope lokaal verkregen ingrediënten. Met name veel mannen zijn aan *kasipu* verslaafd en besteden een groot deel van het inkomen hieraan. Als een huishouden in geldnood verkeert, worden juwelen, als men die nog bezit, naar een pandjeshuis gebracht. In slechts enkele gevallen zijn de betrokkenen in staat binnen een jaar hun eigendommen (met woekerrente) weer terug te kopen.

Hoe wordt de toegang tot, en het vermeerderen van bezittingen en hulpbronnen beïnvloedt door de aard van de omgeving. Welke strategieën gebruiken mannen en vrouwen om beperkingen ten aanzien van hun bestaanszekerheid te boven te komen?

De infrastructuur en mogelijkheden voor transport zijn vooral in het moerasgedeelte van het wetland zeer beperkt. Daarnaast hebben de bewoners van Muthurajawela twee tot drie keer per jaar te maken met de gevolgen van overstromingen na zware regenval. In sommige huisjes staat het water dan een halve meter hoog. In zo'n situatie worden huishoudelijke goederen op elkaar gestapeld, kinderen worden soms bij kennissen ondergebracht en de mensen bivakkeren op hun bed. Er zijn particuliere en overheidsorganisaties die tijdens overstromingen met bootjes voedselpakketten langs de hutten rondbrengen, want koken is in een dergelijke situatie vrijwel onmogelijk. Sommige huishoudens zoeken hun toevlucht in de kerk of een ander gebouw, waar ze verblijven tot het water weer gezakt is. Het hoge water bezorgt veel schade aan de woningen, wat relatief kostbare reparaties noodzakelijk maakt. Als mensen wat geld opzij kunnen leggen, besluiten ze vaak een nieuw huisje te bouwen met een hogere fundering. Dit gebeurt meestal stapsgewijs en kan een paar jaar duren. Soms worden sieraden voor dit doel verpand.

De grootste frustratie van de mensen is wel dat ze zonder geldige papieren in het natuurgebied wonen. Dit beperkt de mogelijkheid, als die zich voor doet, om te investeren in woning en huisraad. Als bewoners van het wetland worden verordonneerd te vertrekken, moeten ze het meeste achter laten. Zowel op de eilanden als in het moeras zelf zijn projecten geweest om een deel van de illegale bewoners te herhuisvesten in een met zand opgehoogd deel van het moeras dat niet tot het beschermingsgebied wordt gerekend. De registratie van landverdeling en landeigendomsrechten is onvolledig en niet erg transparant in Sri Lanka. Hoewel er officieel geen sancties worden uitgevoerd tegen mensen die illegaal op land van de regering wonen, blijft de overheid eigenaar. Om deze reden is wonen in Muthurajawela een onzeker bestaan. Een stem uitbrengen op een lokale politicus kan helpen bij het verkrijgen van een woonvergunning, maar roept weerstand op bij de instanties die zich bezighouden met natuurbeheer. Veel mensen zijn aangesloten bij een lokale organisatie die opkomt voor de rechten van de moerasbewoners. Diverse vissersgemeenschappen hebben hun eigen organisaties.

Veel mensen, vooral vrouwen, ontvluchten de armoede door in het buitenland te gaan werken. De meeste vrouwen vinden dan een baan als huishoudster of kinderoppas, veelal in het Midden Oosten. Meestal gaat dit goed en kunnen ze, na de lening voor de overtocht te hebben afgelost, geld naar huis sturen en huishoudelijke apparatuur belastingvrij aanschaffen tijdens verlof of bij terugkomst. Er zijn er echter ook velen die problemen ondervinden, indien niet in het gastland, dan wel bij terugkomst in Sri Lanka met de achtergebleven familie. Er is ook een groep mensen die hun geluk in het buitenland beproeven zonder officiële documenten of met valse papieren.

Een deel van de bewoners van het wetland is, om aan geld te komen, betrokken bij illegale activiteiten. Deze omvatten: smokkelen naar of vanuit het buitenland; het vangen en verhandelen van beschermde diersoorten, zoals krokodillen en zeeschildpadden; vissen in illegale wateren; en het stoken van *kasipu*.

Wat zijn de visies en praktijken ten aanzien van de preventie en bestrijding van ziekten van wetenschappers en andere buitenstaanders, en die van de moerasbewoners zelf? Welke strategieën gebruiken mannen en vrouwen om een gezond bestaan te waarborgen en ziekte te overkomen?

Het min of meer objectieve beeld: de visie van buitenstaanders
Alcoholisme is een probleem in heel Sri Lanka. In Muthurajawela is het één van de grootste medische en sociale problemen. Veel mensen sterven aan alcohol gerelateerde ziekten zoals levercirrhose. Diarree, hoewel meestal niet ernstig, komt veel voor in de omgeving met name bij kinderen. Dengue en malaria, twee door muggen overgebrachte koorts ziekten, komen nog niet in het moeras zelf voor maar liggen op de loer. Japanse hersenvliesontsteking (JE) en filariasis worden ook door muggen overgebracht en komen wel in het moeras voor. Evenals leptospirosis, een door ratten overgebrachte ziekte. Dengue en leptospirosis zijn duidelijk aan het toenemen volgens statistieken van de plaatselijke ziekenhuizen. Positief is dat, voorzover kon worden nagegaan, er geen sprake is van ernstige ondervoeding in het moerasgebied, en dat de meeste kinderen hun vaccinatieschema voltooien.

Het subjectieve beeld: de visie van de wetland bewoners
De moerasbewoners zelf hebben niet het gevoel dat ze meer worden blootgesteld aan ziekten dan mensen die niet in het moeras wonen. De mensen die in het zuidelijker gelegen moeras

gedeelte wonen, vinden dat ze beter af zijn dan de mensen die in de nabij gelegen urbane gebieden wonen. De vele muggen in het gebied worden als heel lastig ervaren, ze worden echter niet als ziekteverwekkers gezien. Tegen muggen gebruiken de meeste mensen 'coils', die na aansteken acht tot tien uur branden en met hun rook de muggen op afstand houden. De rijkere huishoudens beschermen zich door onder een muggennet te slapen. Overstromingen worden als groot probleem gezien maar niet als een bedreiging voor de gezondheid. Alcoholisme ervaart men als een groot probleem. Het brengt veel arme huishoudens in nog grotere financiële zorgen en in een sociaal isolement. Traditionele gebruiken in Muthurajawela hebben voor een groot deel hun oorspronkelijke betekenis verloren. Dit wordt mede veroorzaakt door de invloed van het Rooms Katholicisme, ooit door de Portugezen verbreid in dit gebied. Traditionele geneeswijzen, zoals *ayurveda* en shamanisme, worden naast de reguliere gezondheidszorg beperkt gebezigd.

Wat is de rol van het milieuproject bij het betrekken van moerasbewoners bij het bewaren van het natuurlijk evenwicht in het gebied, en bij armoedebestrijding?

Het wetland project was in staat om in een periode van anderhalf jaar diverse kleine inkomensgenererende projecten op te zetten met name voor vrouwen. De activiteiten bestaan bijvoorbeeld uit het weven van tassen, manden, place mats en dergelijke van plantaardige vezels; het uitsnijden van kokosnoten tot beeldjes; het vlechten van touw uit kokosnootvezels; het houden van varkens, geiten en kippen. De deelnemers hadden meestal geen ervaring met het soort werk waar ze zich voor hadden op gegeven. Ze kregen daarom eerst technische training en een korte opleiding in handelskennis en boekhouden. Het bleek dat ook daarna nog veel tijd en geduld nodig was voor er tastbare resultaten geboekt konden worden. Hierdoor en vanwege de lage prijzen die de eindproducten opbrachten, vielen veel deelnemers af. De artikelen gemaakt van natuurlijk materiaal zijn niet langer in trek en moeten het veelal afleggen tegen de snel geproduceerde massaproducten.

Omdat het integreren van economische ontwikkeling in milieuprojecten nog in de kinderschoenen staat, heeft men nog geen duidelijke indicatoren kunnen ontwikkelen voor het meten van het milieueffect van de inkomensgenererende activiteiten. Wetenschappers concluderen dat er eigenlijk geen strategie is voor natuurbehoud die overal toepasbaar is. Het is belangrijk de juiste combinatie van strategieën te vinden voor de situatie ter plekke. Praktische gender belangen zijn een belangrijke factor in milieu projecten. Hiermee wordt bedoeld dat het nodig is om bij milieuprojecten in te spelen op de specifieke en verschillende behoeften van vrouwen en mannen. Ervaringen in landen, zoals India en Nepal, leren dat wanneer mensen slachtoffer worden van natuurdegradatie in hun gebied, zij de beste beschermers worden van dat natuurlijk milieu.

Hoewel de mensen in Muthurajawela wetland arm zijn en vele problemen hebben, zijn zij over het algemeen tevreden met hun woonplek. Als het gevoelige ecosysteem echter uit balans raakt zullen, behalve de dieren en planten, vooral de lagune vissers er de nadelige gevolgen van ondervinden. Het is een zorgwekkend vooruitzicht dat de regering van Sri Lanka van plan is een snelweg door het natuurgebied aan te leggen. Dit zou het bestaande conflict tussen natuurbeheer en economische belangen wel eens kunnen vergroten. De meeste mensen zijn echter hoopvol gestemd over de toekomst en kunnen zich nog niet indenken wat de geplande snelweg door het moeras voor hen zal betekenen. Om te overleven hebben ze geen andere keus dan zich aan te passen aan veranderende situaties, en te roeien met de riemen die ze hebben.

About the author

Anneke Hoogvorst was born in Schoorl, the Netherlands, in 1952. She was trained as a nurse in Alkmaar and worked as such for about 14 years, not only in the Netherlands but also in Switzerland and Mozambique. In 1986, she started studying Cultural Anthropology at the University of Amsterdam, which resulted in a Master's degree in 1990. The subject of her M.A. thesis was traditional and modern family planning, for which she did fieldwork in rural Zambia. Later she worked as a medical anthropologist in Sesheke District, Zambia, where she lived for three years. She attended an international course on 'implementing district health care' at the Royal Tropical Institute in Amsterdam, and a course on environment, gender and development at the University of Amsterdam.

From 1993 to 1997, she worked for UNICEF in Sri Lanka and the Philippines, where she was involved in primary health care, water supply and sanitation, AIDS, education, project management, and surveys. She visited Bangladesh and Thailand to study urban and rural development projects and later she carried out research missions in Pakistan for the health and environment section of the International Water Management Institute.

In 1998, she was invited by the Integrated Resources Management Program in Sri Lanka to do an anthropological study on the inhabitants of Muthurajawela wetland and started her Ph.D. research in the wetland in July 1998. She now lives with her husband and daughter on the edge of 'het Twiske', a wetland in the Netherlands.

Writing from dawn till dusk … barely one page.