



Sri Lanka

Decades of ICZM experience

Dianeetha Sadacharan (*Consultant, Coastal and Marine Resources Management*)

Contents

1. Introduction
2. ICZM programme and outcomes:
 - *The Coast Conservation Act*
 - *Coastal Zone Management Plan (CZMP)*
 - *Coastal erosion management*
 - *Setback Areas and response to the 2006 tsunami*
 - *Decentralised approach and Special Area Management (SAM) Planning*
3. Experiences in coastal management and cooperation:
 - *Assessments of the Coastal Conservation Act*
 - *Experience with the implementation of Special Area Management plans*
 - *Benefits of ICM*
 - *International cooperation*
4. Conclusions and responding to new priorities
5. References, PDF reports and Websites

Summary

Integrated management of the coastal zone was needed...that was the notion in the 1970s.

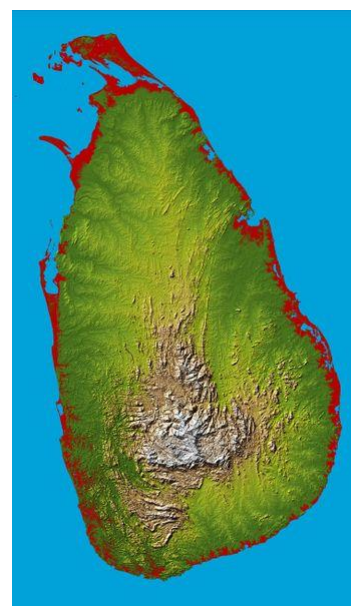
Ongoing coastal erosion triggered the holistic integrated approach. Step by step the coastal zone management programme was broadened to include management of other issues such as water quality, coastal fisheries and aquaculture. In addition, the traditional approach to combat coastal erosion through structural solutions (hard and soft measures) was broadened to non-structural approaches such as to prevent devastating sand and coral mining.

The success of the ICZM approach in Sri Lanka was based on adopting the Coastal Conservation Act, creating the Coastal Conservation Department, producing and updating CZMPs and creating Set back Areas. The Sri Lanka ICZM programme has also been the testing ground for emerging planning approaches, such as Special Area Management Planning, that provide for greater involvement of the stakeholders and the local level administration.

The low-lying parts of the Sri Lankan coastal zone are vulnerable to the impacts of climate change and coastal hazards. The tsunami of the December 2004 inundated large areas along the east, south and southwest coast. Climate change will pose a series of extra challenges due to increasing storm surges and sea level rise. Intensified coastal monitoring and a long-term vision are prerequisites for timely adaptive responses.

Continued cooperation between international, national and local levels is one the key factor for the success of the Sri Lankan ICZM programme, now and in the future.

The topography of Sri Lanka with the narrow coastal zone. (image: NASA/JPL/NGA)



1.Introduction

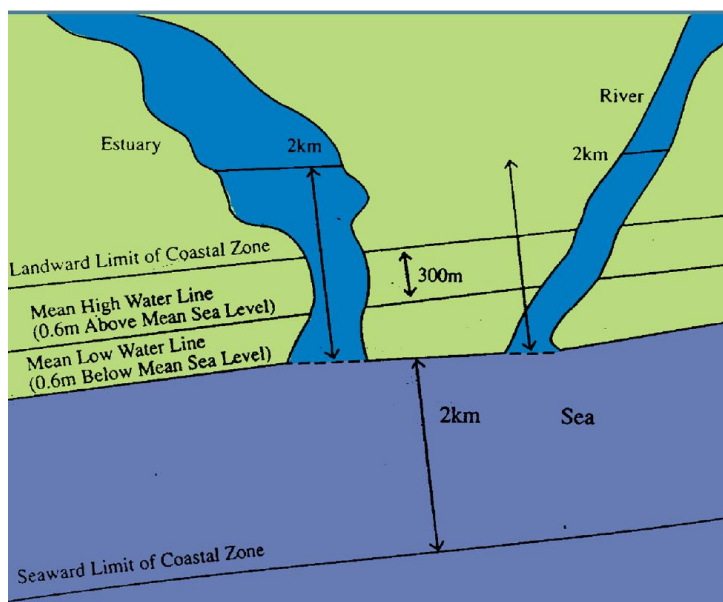
Sri Lanka has a population of about 21 million inhabitants and more than of the population lives in the coastal districts. The relatively narrow coastal zone (Figure 1) is densely populated (480 inhabitants/km²) and has many functional uses. It contains very productive ecosystems that sustain a large part of the country's people, flora and fauna.

Demographic and economic developments have increased the pressure on the resources of Sri Lanka's coastal zone. These stresses cause serious environmental problems, including degradation of protective coral reefs and mangroves. For many years, coastal erosion has continued to be a critical problem. Furthermore, the anticipated impacts of climate change may exacerbate the vulnerability of the Sri Lankan coastal zone.

2. ICZM programme and outcomes

Realising that a more planned and integrated approach for managing coastal problems was needed, an Integrated Coastal Zone Management (ICZM) programme was developed based on the Coast Conservation Act of 1981. The adoption of CZM Plan (1990) and "A Resource Management Strategy for Sri Lanka's Coastal Region – 2000" (1992) provided the policy framework. In the early phase, the programme focused its attention mainly on mitigating coastal erosion and reducing the impact of coastal development by regulating the location of new developments and to a lesser extent, managing coastal habitats. In the later years, the programme was broadened to include other aspects of coastal management: water quality, fisheries and aquaculture. Realising that local level implementation and community involvement are key to effective management, the programme has over the years sought decentralisation. It must be noted however, that prior to 2009, due to the civil strife that prevailed in the North and the East, the ICZM programme did not at first cover these coastal areas. An overview of the key elements of the ICZM programme is provided below:

The Coast Conservation Act -1981



The Coast Conservation Act is recognised worldwide as a pioneering piece of legislation. It provided a solid legislative framework for integrated coastal zone management in Sri Lanka, at a time no more than a handful of countries had initiated similar programmes. The Act laid the foundation for the establishment of the Coast Conservation Department (CCD) and an Advisory Council comprised of government and non-governmental officials. The Act also established a 'Coastal Zone' extending 300m landward and 2 km seaward (Figure: 1) within which all development activities, which altered the physical state of the coast, such as construction, dredging and laying pipelines are regulated and managed through a permit system.

Figure 1 : 'Coastal Zone' as defined in the Coast Conservation Act – 1981. (source: Coastal Zone Management Plan, 2004)

Permits for smaller constructions are issued at the provincial/district level. Permits for larger houses, commercial and industrial buildings and other structures are issued by the Coast Conservation Department (CCD). For larger developments, the developer needs to prepare an Environmental Impact Assessment (EIA), for which the criteria and procedures are

contained in the Coastal Zone Management Plan. The Act also sets out punitive measures for activities that contravene its provisions.

Coastal Zone Management Plan (CZMP)

The Act mandates the Coastal Conservation Department to develop a Coastal Zone Management Plan (CZMP) and update it regularly. The first plan was produced in 1990 and revised plans were developed in 1997 and 2004. The broad objectives of the ICZM Plan are to:

- Identify the nature and magnitude of the problems and issues to be addressed;
- Give an outline of the existing plans, policies, programmes, laws institutional mechanisms and enforcement regimes that influence the management of coastal resources;
- Present objectives, policies, strategies and proposed actions for managing the coastal zone and its resources.

Considering the limitations imposed by an inadequate information base, restricted financial resources and technical capacity, an incremental approach has been adopted for the Plan development process. The 1990 Plan addressed coastal erosion, coastal habitat management and management of areas of archaeological, cultural and historical significance. The scope of the 1997 Plan was broadened and included coastal pollution control and Special Area Management. The 2004 Plan addressed, in addition, the issue of integrating coastal fisheries, aquaculture and public access.

Coastal erosion management

Since the publication of the Coastal Erosion Management Plan in 1984, coast protection has been undertaken in a more integrated and a planned manner. The measures employed to manage erosion, consist of a mix of engineering and non engineering measures. Engineering measures include hard structures, such as revetments, groynes and offshore breakwaters (Figure 2).

Over the years, the design and construction methodology have improved, and monitoring, consultation with stakeholders, as well as implementation of emergency protection measures have also become more effective. Non-engineering measures include the control of sand and coral mining, and the imposition of setback areas for coastal development. The Coastal Conservation Department (CCD) uses the permit procedures to direct new development activities away from erosion prone areas and to prevent new coastal construction exacerbating erosion.



Off shore breakwater

Revetment

Groyne

Figure 2: Structures to combat coastal erosion: 'hard' in places combined with 'soft' measures. (photos: Coastal Conservation Department, Sri Lanka)

The selection of erosion management methods have been a compromise between protection requirements dictated by land use, maintenance capability, environmental requirements and the availability of immediate and long-term funding. Since 1985, several large-scale erosion management schemes have been implemented. Since 2002, in certain stretches of the west and southwest coast, sand nourishment in combination with holding structures has been carried out. Overall, the erosion management measures undertaken to date, provide protection for about 80% of the erosion prone area along the west and southwest coast. Regular monitoring, periodic maintenance of hard structures and sand replenishment are required to ensure continued stability of these areas.

The Coastal Zone Management Plan of 2004 recommended addressing the problem of coastal erosion more holistically. It calls for a broader scope involving the investigation of erosion trends, land and beach use, and socio-economic and environmental conditions in the area under consideration.

Coral mining prohibition

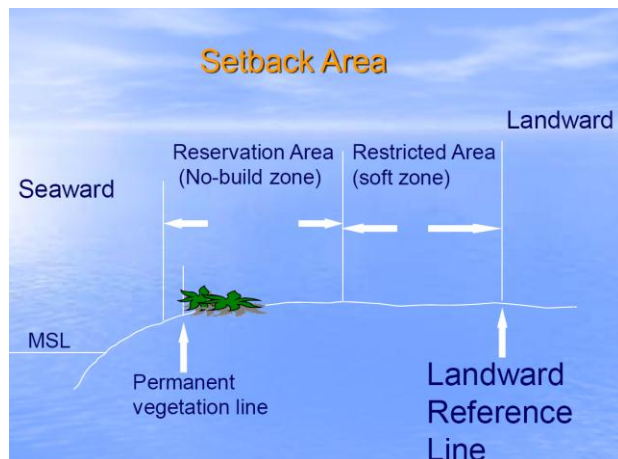
In view of the alarming levels of coral mining, especially along the south and southwest coasts and its impact on beach stability, the Coast Conservation (Amendment) Act No 64 of 1988 prohibits mining, collecting, possessing, processing, storing, burning and transporting in any form whatsoever of coral within the coastal zone. Collection of corals for research purposes is permitted. A CCD study in 1984 revealed that many thousands of tons of coral were extracted annually in south and southwest Sri Lanka. This caused severe coastal erosion, decreasing the natural and touristic values of the coastal areas. Since coral mining provided a lucrative means of livelihood and employment to a large proportion of the population in certain areas the implications for the local economy was considerable. As of 1991, enforcement of this measure and its effects on the livelihood of coral miners was the most difficult challenge faced by the CZM programme. Due to the prohibition imposed by the CCD coral mining was reduced to 50% in 1994. (Seneviratne, 2005).

Regulating sand mining

The primary source of sand to the littoral budget in Sri Lanka is the sand brought into the coastal waters by rivers. Deficiency in this supply would therefore affect the nourishment of the beaches. In the early eighties, the levels of sand mined from both rivers and beaches increased rapidly. A CCD study carried out in 1984 revealed that in the western and south-western coastal areas alone, about 1.5 million m³ of sand was extracted annually from beaches and the lower reaches of the river. Since 1984, the removal of sand from the coastal zone is regulated through the permit procedure and guidelines for sand removal have been developed. A National Sand Study (NSS, 1992) and the follow-up interim sand study undertaken by Lanka Hydraulic Institute, investigated how to prevent and mitigate environmental hazards and degradation caused by practices of sand mining. It also investigated practical alternatives for to the use of river sand, such as using washed sea sand pumped from deep offshore waters.(Hettiarachchi & Samarawickrama, 2005).

Setback Areas and response to the 2004 Tsunami

In the 1980s, so-called setback lines were defined as a geographical strip within which certain development activities are prohibited or significantly restricted. They comprise a reservation area in which only absolutely essential uses/activities are allowed and a restricted area, which can be used for a few low impact activities such as small dwelling units (Figure 3).



Variable setback lines, determined for different coastal sectors, were based on a variety of parameters including coastal erosion rates, coastal geomorphology, extent of coast protection measures already in place and vulnerability of coastal habitats (see: http://www.coastal.gov.lk/Coastal_Setback.pdf). The setback guidelines have been revised on the basis of new criteria and new information and are published in the Coastal Zone Management Plans.

In the wake of the Tsunami in 2004, that ravaged the coastal areas, there was much discussion about setbacks lines. The immediate response of the Government was to declare a 1000 m setback line without due considerations of the implications of establishing and maintaining an area free of development.

Figure 3: **Setback Area** applied in Sri Lanka. (source CZMP 2004)

Subsequently, a buffer zone of 100 m along the west and southwest coast and 200 m along the east coast was declared. However, these declarations failed to recognise the implications of existing laws and regulations, the absence of adequate land outside the buffer zone and the socio-economic implications of large scale resettlement of people (Karunaratne 2008). Further study of the Tsunami impacts and considering the implications of a wide buffer zone, the Government has reverted

to the original setback guidelines contained in the 1997 Plan. Broader buffer zones were only put in place in the most vulnerable areas.

During post Tsunami reconstruction activities included: altering the design parameters for coast protection structures and some harbour breakwaters were altered by increasing the heights in order to provide additional safety, and attempts were made to re-establish greenbelts in some areas. Observations during the aftermath of the Tsunami, made clear that intact coral reefs, vegetated dunes, deep stands of mangrove forests gave significant protection to the coast behind them (UNEP, 2005).

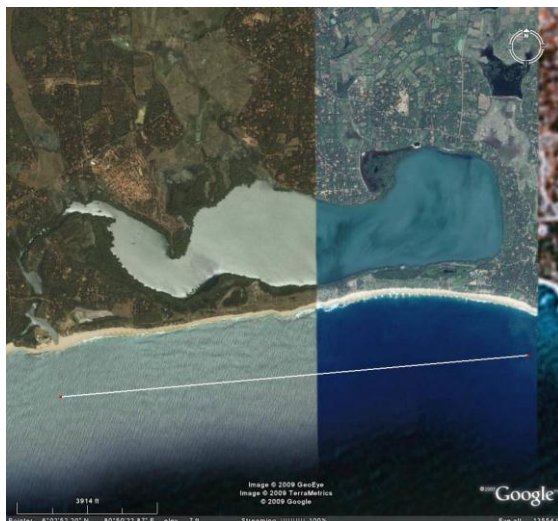
Decentralised approach and Special Area Management (SAM) Planning

The Sri Lanka ICZM programme has also been the testing ground for Special Area Management Planning providing greater involvement of the stakeholders and the local level administration. Sri Lanka's initial coastal management efforts were centrally planned and administered. Small-scale fish farming, mangrove clearing, lagoon fishing, waste dumping and other activities may be relatively insignificant, but the cumulative impacts degrade and deplete coastal habitats. Effective management of these local activities require the support and empowerment of the local administration and the local communities.

Special Area Management (SAM) Planning was seen as an opportunity to organise local communities, identify local problems and design strategies for collective management on the level of community residents and local agencies. SAM plans are a bottom-up strategy for managing coastal resources that complements the existing top-down regulatory approach in Sri Lanka. Participation by community residents or stakeholders in planning and management is central to the SAM concept. The SAM projects include several types of management interventions including education and awareness programs, collaborative self-management, capital development projects, micro-enterprise development. In the mid-1990s, three pilot projects were developed at Rekawa Lagoon, Hikkaduwa and Negombo lagoon/Muthurajawela wetland area.

1. Pilot Rewaka Lagoon – south coast - 75 km E of Galle

Rekawa Lagoon (area 250 ha) is a shallow and brackish coastal lake, situated along the south coast 75 km east of Galle. It receives freshwater from the river Kirama Oya and is connected to the sea via two outlets. The presence of mangroves, along with coral reefs and five species of globally threatened marine turtles in nearby coastal waters, give a high biological value to the lagoon and surrounding environment. Fisheries are the most important livelihood of the rural village community.



One of the main components of the SAM plan was to stop destructive activities, such as coral mining and mangrove removal. The plan addresses problems such as: poverty in the community, coral mining, sea turtle egg poaching, restricted water exchange between sea and lagoon, and overfishing in the lagoon. The Fishery Cooperative Society adopted rules governing lagoon access and gear requirements. The initial implementation of the plan received external support from the ADB (Coastal Resources Management Project).

Figure 4: Rekawa, the lagoon system along the south coast of Sri Lanka. (photo: Google Earth: Image ©2009Geo Eye Image 2009 TerraMetrics 2009 Google)

The basic objective of the plan was resource management, combined with community and livelihoods issues. For example:

- A causeway structure was replaced by a bridge, allowing exchange of water and shrimp larvae and, increasing the shrimp production and water quality of the lagoon and
- Promoting eco-tourism to provide alternate livelihood opportunities.

Figure 5: The low lying coastal areas exhibit considerable variety of landscape types: bays, lagoons, headlands, marshes with lush coastal vegetation, beaches and dunes. Sri Lanka is the most biologically diverse country in Asia per unit area, UNEP 2005. (photo: Rekawa Lagoon, Sri Lanka: © Chandana Gunasena)



2. Pilot Hikkaduwa – 15 km NW of Galle

Hikkaduwa is a tourist resort about 100 km south of Colombo. The 4 km coastal strip bordering Hikkaduwa town was known for its coastal reefs, sandy beaches, waves and relatively clean marine waters. The rapid growth of tourism has contributed to a number of problems, including degradation of the coral reef ecosystem (mainly due to coral mining), deteriorating coastal water quality, increasing traffic congestion and noise, and conflicts between tourist and fishing interests. The main SAM activities planned were the construction of a central sewerage and a waste management system, construction of a fishery harbour and the establishment of a marine reserve. The marine area near Hikkaduwa was declared a nature reserve in 1988 and upgraded in 2002 to be one of the two marine nature parks of Sri Lanka.



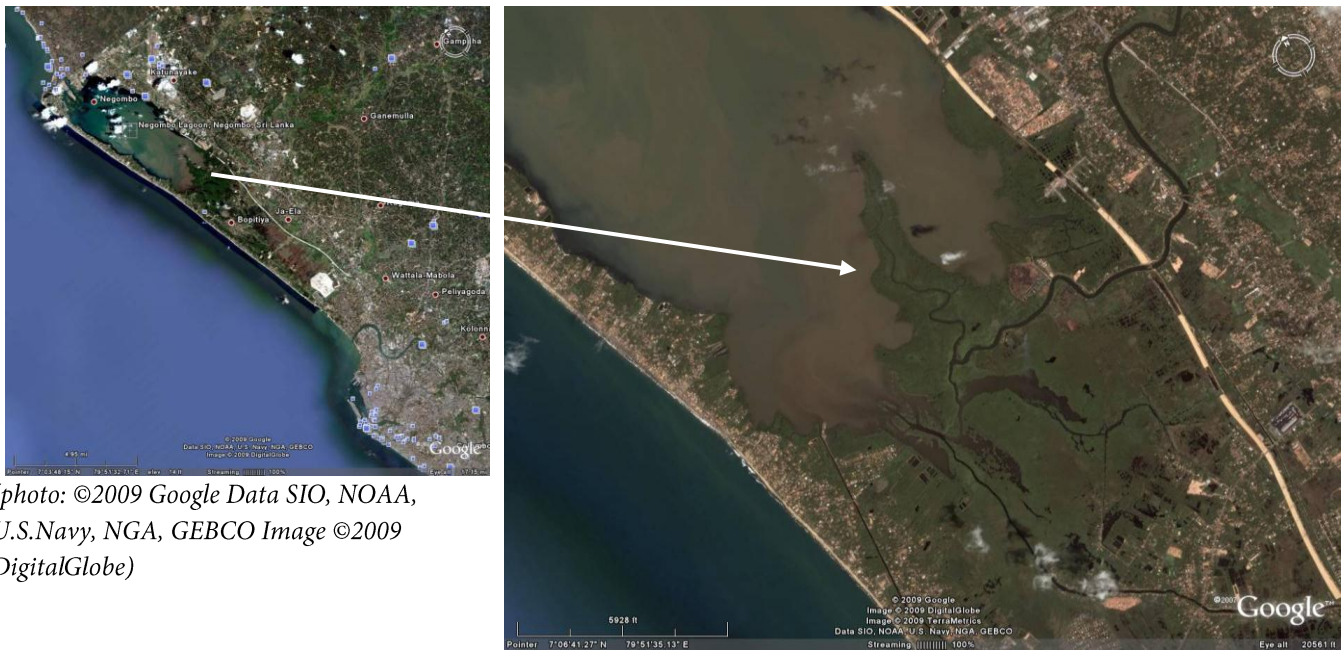
Figure 6: SAM pilot - Hikkaduwa with reefs, in the south west coast of Sri Lanka. (photo: ©2009 Google Image ©2009Geo Eye Image ©2009 Digital Globe)

3. Negombo lagoon and the Muthurajawela wetland area – 20 km N Colombo.

The Muthurajawela Marsh and Negombo lagoon wetland ecosystem (7,000 ha) is situated near Colombo. The marsh and lagoon system provides numerous services, both to people and nature, and the total economic importance of the estuarine system exceeds 8 million US\$ annually (IUCN, 2003). However, there is little management of the wetland resources and the system is under severe stress due to destructive fishing gear, encroachment into the lagoon, expanding housing areas and water pollution, and social disparity. The communities were initially not organised at a level that allowed them access to technical or policy discussions. In 1991, the Greater Colombo Economic Commission (GCEC) and Euroconsult Netherlands, began an Environmental Profile and a Master Plan for the Lagoon ecosystem with funding and technical assistance provided by the Dutch government. The Wetlands Conservation Project of the Central Environmental Authority (CEA 1994, 2003) piloted the process of Special Area Management. Some of the results included:

- The declaration of the Muthurajawela Marsh Conservation Zone as a sanctuary under the Fauna and Flora protection Ordinance;
- The preparation of a fishery management plan by the Department of Fisheries;
- The boundary demarcation along the Negombo lagoon by a fisheries community organisation;
- The establishment of a Muthurajawela Visitor Centre and related infrastructure such as a board walk through the wetlands for nature education, bird-observation and eco-tourism.

Although the visitor centre is not functional at present, eco-tourism in Muthurajawela Sanctuary is gradually developing (see: Muthurajawela Sanctuary website). Maintaining the infrastructure and assisting the community in effectuating the management plans are the concerns for all involved in this SAM pilot.



(photo: ©2009 Google Data SIO, NOAA, U.S.Navy, NGA, GEBCO Image ©2009 DigitalGlobe)

(photo: ©2009Google Image ©DigitalGlobe Image ©2009 TerraMetrics Data SIO, NOAA, U.S.Navy, NGA, GEBCO)

Figure 7: SAM pilot – Negombo lagoon and the Muthurajawela wetlands, just north of the capital Colombo.

3. Experiences in coastal management and cooperation

Assessment of the Coast Conservation Act

Recently, the Coast Conservation Act was assessed (Karunaratne, 2008). This assessment revealed that although a comprehensive policy framework is available for the management of the coastal zone in Sri Lanka, the legislative framework in its present form is insufficient to achieve the stated policy objectives. The main shortcomings identified are:

1. More effective control on sand mining by the CCD is hampered by the Mines and Minerals Act of 1992;
2. The definition of the coastal zone is too narrow allowing detrimental activities outside the defined coastal zone, which adversely affect the coastal zone;
3. The absence of a legal basis for Special Area Management.

Experience with implementation of Special Area Management plans

The initial implementation of pilot scale SAM plans received financial and technical support from external project funds. In addition to the above three, CCD initiated SAM projects at five other sites.

Although the implementation of SAM plans has had reasonable success at the project level, sustaining their management has encountered problems. Once a project in a SAM site ended, it was difficult for the local authorities and the community organisations to sustain the momentum or continue all the activities set out in the SAM plans.

For example, in Hikkaduwa, the local residents and commercial establishments have been slow to construct sewerage connections from their properties to the central sewerage system. In the Negombo lagoon, the Fisheries and Aquatic Resources regulations do not have sufficient legal force to control activities that are detrimental to the marsh/lagoon system. Sustainability of these local level management measures require several improvements at the level of local administration. These include allocation of budget, provision of the institutional and legal support necessary for local level implementation through amendments to the Coast Conservation Act and local ordinances, establishment of local level ICZM units with dedicated staff and strengthening of ICZM capacity at local levels. Formal arrangements with local level NGOs are often imperative for effective implementation and sustaining community participation. Where appropriate, planning and management of SAM sites should be incorporated within development plans of regional/national development projects.

Benefits of ICZM

The benefits of ICZM deal with improved economic and environmental values for coastal population. Intact and robust ecosystems, such as mangrove, coral reefs and vegetated dunes, are able to absorb strong wave actions. These valuable systems lessen the impacts of natural disasters (tsunamis, cyclones, storm surges) as was experienced in Sri Lanka during the onslaught of the Tsunami in 2004 (UNEP 2005).

As well as offering protection, conservation of the mangrove and coral systems also increases biodiversity, enhancing fish productivity, improves livelihoods and offering high quality tourism.

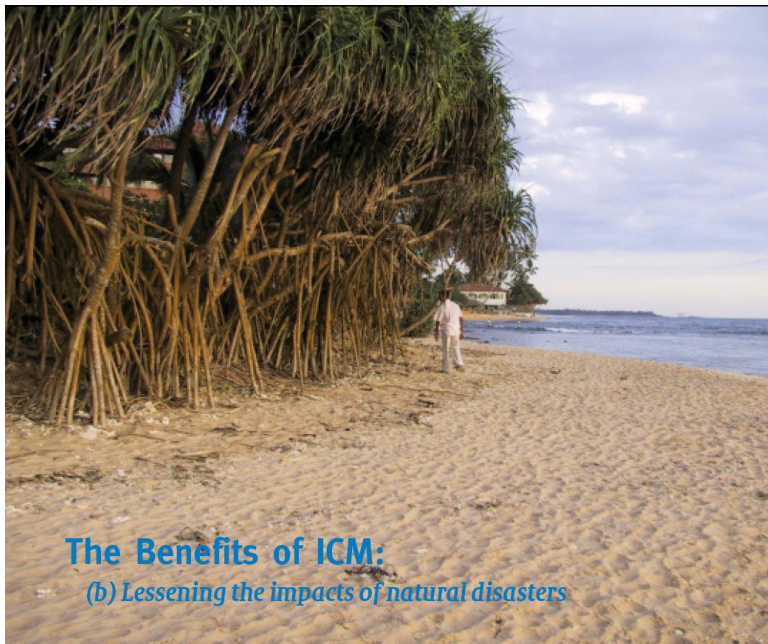


Figure 8 : Conservation of coastal vegetation is a good investment for coastal protection. (source: EUCC, Coastline Special on Integrated Coastal Management, Vol.15, no 2006-1/2, PDF report)

International cooperation

Planning and implementation of an ICZM programme and associated activities is a comprehensive, long term and complex task. The Sri Lanka programme has been successful in accessing international cooperation and external funding from several sources. Technical assistance and funding to manage coastal erosion, planning and execution of hard and soft protective measures, has come from DANIDA (Denmark), GTZ (Germany), the Netherlands (Ministry of Foreign Affairs, Delft Hydraulics, Arcadis & Euroconsult) and the Asian Development Bank (ADB). The development and implementation of some of the Coastal Zone Management plans and SAM plans was supported by the USAID and the Coastal Resource Centre - Rhode Island, United States.

Because of this foreign assistance and the contributions made by the Sri Lankan government, its Coastal Zone Management Program became a successful model among developing countries.

Knowledge exchange with other Asian coastal states concerning issues such as ecological restoration in coastal zones (e.g. Casuarina shelter belts in Hainan – China and in Tamil Nadu, India) and mangrove planting in Indonesia, Bangladesh and Vietnam (see also CCC II-1, 4 and 8) can be beneficial for strengthening the coastal resilience of Sri Lanka. Thailand's efforts to restore a degraded aquaculture landscape also provide a valuable experience (CCC II-7-1).

Sri Lanka participates in the South Asia Marine and Coastal Protected Area – network (see SA-MCPA –website). This network of coastal cooperation has recently published a MCPA-Toolkit for South Asia. This Toolkit is built on the Toolkit developed for the West Indian Ocean Region to support the Marine Protected Area - Training Manual (Francis et al. 2003), which was developed with assistance of the CZM-Centre/Netherlands Ministry of Transport, Public Works and Water Management (see CCC III-3-2-7).

4. Conclusions responding to new priorities

Several recent reviews of the Sri Lanka's ICZM programme have highlighted the need for review and change in direction of the ICZM programme in Sri Lanka (Coastal Zone Management Plan 2004, Karunaratne, 2008, Lowry et al. 2007 and Wickremaratne, 2007). Some priorities identified include:

- The Coastal Conservation Act needs review in order to strengthen the legislative framework to meet the current management imperatives. The Act should provide for the regulation of activities that are located outside the defined Coastal Zone but having impacts within the Coastal Zone;
- The successful decentralisation through adequately funded SAM efforts should gain more legal and institutional support. They also require financial commitment from local authorities, after the external financial and technical support has come to an end;
- The maintenance of the coastal stabilisation schemes already in place will require the continued commitment of significant funds by the government. Intense efforts to control sand-mining in the lower reaches of rivers needs to continue as well as making available viable alternatives to the supply of river sands to lessen the pressure of coastal erosion;
- Responding to natural hazards, effects of sea level rise, and to changes in storm and rainfall regimes affecting the increasing coastal population will be a growing concern of the coastal managers. Planning adaptive response measures, such as buffer land acquisition proposed in the CZMP 2004, is seen as being even more critical after the Tsunami;
- Although Sri Lankan coastal management agencies are staffed by a number of well-educated and committed professionals, further capacity building is important in the fields of inter-agency collaboration, community based management, monitoring, coastal information systems for the assessment of the impacts of pollution and climate change and identification of adaptive response options.

Sri Lanka is one of the few coastal countries with a long history of ICZM. This long-lasting experience clearly shows that ICZM is a continuous cyclical and interactive process providing the enabling conditions for sustainable development of coastal zones. Continued international cooperation and efforts of the Sri Lankan government are needed to begin a new generation of ICZM activities, which can effectively address the complex coastal challenges ahead.

5. References:

- **CCD - Coast Conservation Department, 1992:** *A Resource Management Strategy for Sri Lanka's Coastal Region – Coastal 2000*; Government of Sri Lanka.
- **CCD, 2005:** *Special Area Management Plan for Negombo lagoon*; produced by the Negombo Special Area Management Community Coordinating Committee.
- **CEA (Central Environmental Authority)/ Euroconsult, 1994:** *Conservation Management Plan for Muthurajawela Marsh & Negombo lagoon*; Ministry of Environment and Natural Resources, Sri Lanka.
- **CEA/Arcadis Euroconsult-Netherlands 2003:** *Integrated Resources Management Programme (IRMP)*; in Wetlands Final Project Completion Report. Ministry of Environment and Natural Resources, Sri Lanka.
- **CEA/Arcadis Euroconsult-Netherlands, 2004:** *Lessons learned from 12 years of wetland work in Sri Lanka*; Integrated Resources Management Programme (IRMP), Central Environmental Authority, Ministry of Environment and Natural Resources.
- **CEA (Central Environmental Authority) 2006:** *A simple Guide to Strategic Environmental Assessment*; Sri Lanka
- **Francis, Julius, Ron Johnstone, Tom van 't Hof, Carien van Zwol and Dianeetha Sadacharan, 2003:** *Training for the Sustainable Management of Marine Protected Areas: a training manual for MPA managers*; CZM-Centre, WIOMSA, University of Dar es Salaam and World Bank; ISBN 9987-8977-1.
- **GCEC - Greater Colombo Economic Commission, 1991a:** *Environmental Profile of Muthurajawela and Negombo Lagoon*; GCEC & Euroconsult, Netherlands.
- **GCEC, 1991b:** *Master Plan of Muthurajawela and Negombo Lagoon*; GCEC & Euroconsult, Netherlands.
- **Hettiarachchi, S.S.L. & S. P. Samarawickrama, 2005:** *Planning and implementing coastal management in Sri Lanka*; Proceedings of the Institution of Civil Engineers, Maritime Engineering 158, March 2005, Issue MA1, p 25–32
- **Hoogvorst, A., 2003:** *Survival strategies of people in a Sri Lankan wetland: livelihood, health and nature conservation in Muthurajawela*. Wageningen University, The Netherlands (2003) 185 pp. ISBN: 90-5808-859-6
- **NSS - 1992:** *National Sand Study for Sri Lanka, Phase One*; Vols 1 & 2. Delft Hydraulics and Netherlands Economic Institute, Delft, the Netherlands, 1992.
- **Karunaratne P, 2008:** *A review of coastal zone laws and implementation experience in Sri Lanka*; Gov. of Sri Lanka.
- **Lowry. Kem, Amararatne Yakupitiyage, S.L. Ranamukhaarachhi, and Glenn Ricci. (2007):** *Assessing Capacity for Effective Coastal Management in Sri Lanka*; In “An Assessment of Capacity for Effective Coastal Management”, A collaborative study by the Asian Institute of Technology, Thailand and Coastal Resources Centre, at the University of Rhode Island, U.S.A.
- **Seneviratne, Chandana (Central Environmental Authority), Sri Lanka, 2005:** *Coastal zone management in Sri Lanka – current issues and management strategies* – weblog 26/02/02005
- **UNEP 2005:** “After the Tsunami – Rapid Environmental Assessment” - Sri Lanka, p56–76 ; February 2005, ISBN 92-807-2565-3
- **UNWTO : United Nations World Tourism Organisation, 2008:** *UN World Tourist Barometer*; October 2008,
- **Wickremaratne, H.J.M., 2007:** *Draft Chapter on Coastal Resources in Global Environmental Outlook 3*; UNEP

PDF Reports:

- **CZM Plan 2004** : *Coastal Zone Management Plan 2004 Second Revision*; Sri Lanka:
http://www.coastal.gov.lk/act_czmp_ccd.htm
- **CEA - CENTRAL ENVIRONMENTAL AUTHORITY, 2006** : *A SIMPLE GUIDE TO STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)*; Sri Lanka :
www.cea.lk/pdf/SEAGuideline.pdf
- **EUCC : Coastal and Marine Union – EUCC, 2006**: *ICM do we really have a choice*; Copranet/Interreg IIIC/EU; EUCC Coastline Special on Integrated Coastal Management, Volume 15, p24, No 2006-1/2, ISSN 0928-2734:
http://spicosa-inline.databases.eucc-d.de/files/documents/00000647_ICM_copranet.pdf
- **IUCN, 2003**: *MUTHURAJAWELA MARSH, SRI LANKA: Safeguarding wetland protected areas in cities; Case studies in Wetland valuation # 1, May 2003*:
<http://cmsdata.iucn.org/downloads/casestudy01muthurajawela.pdf>
- **Olsen, S., Sadacharan D., I.I. Samarakoon A.T. White H..M. Wickremeratne M.S. Wijeratne (eds), 1992**: *A Resource Management Strategy for Sri Lanka's Coastal Region – Coastal 2000*; Coast Conservation Department of Sri Lanka and Coastal Resources Center The University of Rhode Island:
http://pdf.usaid.gov/pdf_docs/PNABP777.pdf

Websites:

- **CCD - Coast Conservation Department, Sri Lanka**:
<http://www.coastal.gov.lk/>
- **Muthurajawela Sanctuary** : *'Holiday in Sri Lanka'* – July 2009:
<http://www.youtube.com/watch?v=VpqYBAwpR2Q&feature=geosearch>
- **SA-MCPA: South Asia Marine and Coastal Protected Area and ICRAN – network**:
<http://www.icran.org/index.html> & <http://southasiamcpaportal.org/>
- **Sri Lanka ICM Profile**:
<http://www.globaloceans.org/icm/profiles/srilanka/srilanka.html>
- **UN-ESCAP, Thailand**:
http://www.unescap.org/drpad/vc/conference/bg_lk_5_mmn.htm
- **UNWTO – United Nations World Tourism Organisation**:
<http://unwto.org/en>