

INTEGRATED PLANNING FOR MANAGEMENT OF COASTAL RESOURCES: MALAYSIA'S EXPERIENCES

Kim-Looi Ch'ng

International Division, Ministry of Science, Technology and the Environment,
Kuala Lumpur, MALAYSIA

ABSTRACT: Planning in Malaysia is on a sectoral basis. Integrated coastal resources management (ICRM) is therefore a new concern in Malaysia. Under an ASEAN-US initiative, Malaysia undertook on a pilot basis to establish an Integrated Coastal Resources Management Plan for South Johore, a southern state in Malaysia, in 1992. The results of this project and the need to address the critical issue of coastal erosion has recently prompted the Government of Malaysia (GOM) to embark on the establishment of a National Coastal Resources Policy. This paper outlines the main issues, problems and lessons learned in the establishment of ICRM plans, using the experiences learned from the South Johore case study.

INTRODUCTION

Integrated coastal resources management (ICRM) is a new concern in Malaysia. In 1992 under the auspices of the ASEAN-United States (US) Coastal Resources Management (CRM) Project which aimed to enhance the capabilities of ASEAN nations in the management of their coastal resources, Malaysia undertook to develop a site-specific ICRM plan for South Johore.

The promising results of this project and the emergence of several issues in the coastal zone and the adjacent marine waters have caused the Government of Malaysia (GOM) to consider this new approach to planning for the management and the development of its coastal resources.

The predicted human-induced climate change and the subsequent rise in sea level will significantly increase the stresses on the coastal resources and the coastal zone. A successful adaptation to sea level rise will require exceptional foresight and significant changes in how Malaysia manages her coastal areas. Many of the responses to sea level rise are similar to those required to address the present coastal management problems. Therefore plans to respond to sea level rise predictions should be implemented within a broader coastal zone planning and management concept.

The critical issue of coastal erosion faced by the GOM poses a potential threat to resources and economic activities within and adjacent to the coastal zone. A national erosion study in 1986 showed that 27% of the coast was subject to coastal erosion (Economic Planning Unit (EPU) 1985). This problem underscores an urgent need for a more integrated and long-term approach towards the solution of the problem.

COASTAL RESOURCES AND THEIR UTILISATION: ISSUES AND PROBLEMS

National Issues

The coastal waters of Malaysia have some of the world's richest ecosystems characterised by fringing coral reefs and dense mangrove forests. The highly productive and diverse tropical ecosystems of the coastal zones are important sources of food and resources for industries, which provide employment and foreign exchange earnings for the nation. More than 55% of the population live along the coastal zone,

with several capital cities and industries located in the area which occupies only 9% of the total land mass (EPU 1992).

The coastal zone is subjected to heavy economic pressures from a variety of activities, notably fishing, coastal aquaculture, waste disposal, sand mining, oil and gas drilling and refineries, tanker traffic, construction, industrialisation, tourism, farming and plantations. Such activities have over the years severely degraded and over exploited the coastal and marine resources, resulting in serious impacts on the productivity of the coastal ecosystems.

Transnational Issues

Coastal waters and their biota are closely linked physically, chemically, biologically and ecologically with offshore waters. All ASEAN nations, including Malaysia share the waters of the South China Sea and all have jurisdiction of waters that verge on those of neighbours - both non-ASEAN and ASEAN. Besides this, Malaysia has overlapping claims with several of its neighbours: with Thailand over the Joint Development Authority Area, with the Philippines over the Spratly Islands, with Indonesia over Pulau Sipadan.

In the Southeast Asian region Malaysia, Indonesia and Brunei Darussalam are oil producing nations and lately, Vietnam is entering into oil exploration with Malaysia. Singapore which does not produce any oil, is however the largest container port in the world and is a site for several refineries of major oil companies.

The narrow Straits of Malacca is heavily traversed by at least 600 merchant ships, fishing vessels and oil tankers daily. 72% of east-bound tankers fully loaded with oil, some as big as 300 000 tonnes, use this strait (Chou et al. 1991). Empty tankers also unload their oil dregs into the sea. In recent years massive oil spillage, resulting from collisions and subsequent fires of oil tankers, such as those of the *Maersk Navigator* and the *Nagasaki Spirit* has underlined the imperativeness for an integrated approach which would safeguard the integrity of the Straits.

Other dangerous cargoes such as toxic chemicals, liquefied natural gas, nuclear spent fuel, and wastes are also transited across the Straits of Malacca and are potential pollution problem.

Some migratory fish stocks such as the mackerel and the yellow fin tuna are shared with Thailand and Indonesia and poses problems of management. Both Malaysia and Indonesia and also Philippines share similar stocks in marine turtles.

The above scenario means that the management of Malaysia's coastal zone will invariably involve transnational issues in the Exclusive Economic Zone and will require regional cooperation in the waters of the South China Sea and the Straits of Malacca and Singapore.

LONG TERM DEVELOPMENTS

Several long term developments will have their impact on the coastal zones. These include the predicted sea level rise and other impacts of climate changes (SLRCC); the rapid shift from agriculture to industry base economy and the increasing population giving rise to the problems of sewage and toxic wastes disposal and water requirement; the depletion of beneficial natural resources such as forests, mangroves, coral reefs with their incumbent costs to the economy of the nation and the transnational issues of pollution and over exploitation of marine resources.

Sea Level Rise and Other Impacts of Climate Change

Malaysia is not a hazard prone country. Therefore SLRCC is not expected to herald any catastrophic events except for increased flooding and aggravated water stress with its accompanying socioeconomic impacts. Impacts on the natural ecosystems will be gradual and will be seen in saline intrusion in surface and ground water and changes in coastal and river morphological processes.

Changes in the salinity contents of ground and surface water will produce an additional stress on the already stressed ecosystems and the increased needs of water for human consumption and industries with the predicted increase in the population and the rapid industrialisation of the economy.

The lack of knowledge on the mechanics of erosion on a muddy substrate and mangrove response to sea level rise does not allow the prediction of mangrove retrogressions presently (Teh 1989).

The first direct impacts of a predicted SLR will be in the flooding of low lying coastal plain due to a eustatic rise in sea level. Coastal erosion which is already a critical issue presents the most serious problem (Chong 1990). Peninsular Malaysia, where two thirds of the eroding coastline identified are located, will be the more severely affected (Teh 1989). The destructive nature of the wave-generated forces will put shoreline facilities at risk, inflicting damage on shorefront properties and infrastructure such as beach resorts, townships, coastal roads and drives, oil and gas refineries, harbours, coastal farms and plantations and aquaculture farms.

SLRCC is predicted to have an impact on the coastal areas. However, the identification of policy responses will need more studies on morphological processes, socioeconomic aspects and ecological responses. Many of the problems that will result from a SLR are mainly anthropogenic: the result of reclamation, the conversion of mangroves for other economic uses, construction on the water edge etc. Hence a recommended policy response should logically be for the establishment of a national coastal resources management policy.

Sewage and Toxic Wastes Disposal

It is a known fact that one of the major causes of marine ecosystems degradation is land-based sources of pollution in particular sewage and waste water discharges. The technology for the management of hazardous substances in the form of wastes are known. However the cost to establish such management systems are nearly always exorbitant, beyond the paying capacity of developing countries. There should therefore be a serious effort for international bodies and banks for the modification of existing policy for concessional loans to developing countries on coastal and marine environmental management and protection. Also loans given for other purposes should have some leverage for directing the priority of coastal nations towards this type of management.

Transnational Issues of the Management of the Marine Environment

The long-term solution of marine environmental degradation and pollution problems for Malaysia cannot be accomplished without regional cooperation. This can be within the ASEAN framework and the UNEP Regional Seas Action Plan for the East Asian Seas. As more and more countries decide to join these two bodies the cooperation can be expanded to cover the whole of the South China Sea.

In this context the ASEAN Environment Programme (ASEP) under the aegis of the ASEAN Senior Officials on Environment (ASOEN) has established, among one of its goals, the promotion of cooperation in the fields of environmental management and the implementation of common strategies to tackle regional environmental issues including those in the common seas, land-based pollution, conservation of biodiversity, air quality etc. (ASEP 1989; Bakar 1991).

In addition, Malaysia and its ASEAN neighbours will need to sign and ratify several of the international conventions on the prevention and control of marine pollution. Consideration should also be given to the establishment of comprehensive agreements for the management of the marine environment within the framework of ASEP.

On the question of over-lapping claims in the waters surrounding the Sprately Islands, ASEAN member countries have met twice and have established recommendations for the conservation of these waters. A meeting is scheduled to be held in Jakarta shortly to consider the recommendations made. In the same context ASEAN has proposed to China to resolve their conflicting claims over these islands by peaceful means, perhaps within the framework established by the ASEAN member countries. In this context China has been urged to sign the Treaty of Amity and Cooperation in Southeast Asia.

In the Malacca Straits, Malaysia, Indonesia and Singapore have established a Tripartite Technical Working Group to tackle the problem of safety and pollution of the straits. The rules established by the littoral states and recognised by the IMO for transit in the straits have only been subjected to "passive" compliance but the recent oil spillage by tanker collision makes it imperative to have a more comprehensive plan to undertake maritime surveillance, monitoring of oil pollution, joint enforcement and joint financing of measures to safeguard the integrity of the straits. The plan should consider the expansion of the scope of the existing Revolving Fund to Combat Oil Spills in the Straits of Malacca and Singapore to include user-states (DOE 1993) and the proposals by the private sector, including commercial banks, such as the Bank of America, to help develop a Regional Spill Response Organisation - an organisation which will be co-owned by member states, supranational agencies and private sector.

Several projects are being developed by ASEAN in association with its Dialogue partners and by UNEP-COBSEA, UNDP and IUCN towards the comprehensive management of the marine environment in the ASEAN waters: the ASEAN-Australian Marine Science Project which has carried out research and established a database of the coastal ecosystems of ASEAN waters; the ASEAN-Canadian Marine Science project which is establishing criteria for the monitoring of marine pollution in the ASEAN seas; the ASEAN-US Coastal Resources Project which has enhanced the capabilities in ASEAN on coastal resources management; IUCN/GBRMPA/World Bank Global Representative System of Marine Protected Areas in the East Asian Seas which seeks to map out existing and potential marine protected areas (MPA) in the ASEAN region with the aim of improving the management of MPAs; the Australian Tropical Marine Ecosystem Management (TROMES) project which seeks to enhance the capability of ASEAN member countries in tropical ecosystem management; UNEP-COBSEA EAS 26: Conservation and sustainable development for the East Asian Seas and EAS 28 project: CRM plan project for the EAS, both of which seek to enhance the capacity and capabilities of ASEAN member countries in marine and coastal resources management; ASEAN-EC Marine Science Programme; ESCAP Project on Environmental Impacts on Coastal Areas and the UNDP/GEF Project on Prevention and Management of Marine Pollution in the East Asian Seas.

LESSONS FOR INTEGRATED COASTAL RESOURCES MANAGEMENT

The planning process, strategies and methods for integrated coastal resources management (ICRM) have been rigorously and extensively treated by various people. However ICRM is a complicated process. This is especially so in Malaysia where the three tier system of government - federal, state and local is practised: the state government has jurisdiction over all land and the foreshore up to three miles from the low water mark and the superjacent waters, and the federal government has jurisdiction over the estuarine and marine living resources from the low water mark to the boundaries of the exclusive economic zone, and over the non-living resources from the three miles from the low water mark to the edge of the continental shelf.

The most concrete and evident accomplishment of the ASEAN-US CRM project was the development of an implemental management plan which was acceptable to the various resource managers and administrators, both federal and state. Lessons learned from it has identified a number of *sine qua non*, which are essential for the successful establishment and implementation of a ICRM plan.

The prime elements lies in the establishment of institutional and legal mechanisms for plan formulation and implementation; the creation of capability for planning, review, monitoring and enforcement and economic analysis of costs and benefits to allow for decisions on priority action, the incorporation of environmental concepts, good data base and adequate funds for the implementation of the plan and capability building. In the formulation of the plan what was important was a technically competent and experienced multi-disciplinary local team, with good teamwork and a strong and committed leadership to build a plan based on consensus of all interested parties in the management and use of the resources in the area.

Legal and Institutional Issues

Institutional and Political Support

ICRM needs to command an enhanced interest, support and commitment at all levels of government and administration - political, policy, administrative and managerial - for it to be feasible. The South Johore project had strong support from the central government, the Chief Minister, the Directorate of the State Economic Planning Unit (SEPU), the various levels of government authorities federal, state, and local authority and the various agencies, both state and federal which have jurisdiction over the resources and activities prevalent in the coastal zone. This support was obtained firstly by exposing the individuals involved to the principles of, the rationale for and the efficacy and the benefits of ICRM, and secondly, by involving them in the planning process from the start to the final completion of the project.

Persuasive economic evidences, with identification of impacts, assessment of benefits and costs and analysis of alternative development are however needed to enable the political and administrative leaderships evaluate the tradeoffs between the latter and resource-use scenarios (Clark 1992). There is however a dearth of expertise in developing countries for such types of urgently needed analysis and hence the need to enhance the capability of resource managers in this field.

Legal and Institutional Arrangements

Secondly the recommended policy for ICRM must be custom-made to fit into the legal, institutional and organisational setup of the country. In the short run an entrenched bureaucracy will find it hard to accept a new approach to management and shifting of

responsibilities and jurisdiction. A reorganisation of jurisdiction and management can only come in slowly in the long run. The South Johore project therefore did not recommend a new organisation or the transfer of authority.

Integration and Coordination

Thirdly there is a need for the essential mechanisms of integration, collaboration and coordination within the nation, vertically between the federal and state governments/local authorities and horizontally between sectors, at both the planning and the implementation stage of ICRM to ensure the widest and most effective participation of government agencies, public and private sectors.

Consensus planning involving all levels of government both vertically and horizontally are therefore essential ingredients to an implemental ICRM plan. The planning process must be multidisciplinary and integrate all issues (Chua & Scura 1992). Management plans will have still to be implemented by relevant sectoral agencies and coordination is required to ensure the overall integrity of the ICRM plan. The South Johore project used a series of workshops - policy and technical - where the actual planning was done by resource managers from various agencies (both state and federal) together with the district administrators and local government agents responsible for the development of the area and scientists who had carried out the research and impact analysis. Public support was garnered through publicity via mass media and articles about the project.

Presently there is a lack of such type of mechanism within Malaysia, resulting in conflicts of objectives between sectors and unclear lines of responsibilities and tasks between different levels of government and between sectors.

A clear example is the approval for project proposal and regulation and enforcement of the Environmental Quality Act (EQA) 1974 in Malaysia. The procedures for project plan approval and the monitoring and enforcement of the EQA during the life of the project is not explicit, giving rise to numerous problems in the approval and regulation of proposed development projects. Conditions imposed by the Department of Environment (DOE) are unable to be enforced by the local authority at the ground level.

There is therefore a need for a strong central authority both at the state and federal level for the coordination of policies with respect to planning and financing, and for coordination of plan implementation in the coastal zone. The management process and lines of authority must be explicit and well structured.

Incorporation of Environmental Concepts into the Development Planning Process

Environmental impact assessment (EIA) should be used more effectively as a planning and management mechanism. EIA is actually a pro-development tool for management that improves the success of and sustains the life of projects and generates alternative approaches that improve the chances of success (Carpenter & Maragos 1989). The EIA, as currently applied in the EQA 1974 has several weaknesses:

- It focuses on potential pollution problems from point sources and the reduction of pollution to acceptable standards, but it does not assess other critical ecological processes essential to the integrity of the ecosystem (Ch'ng et al. 1992).
- It is project-driven and often comes in late in the development sequence, when critical decisions about the project have also been made and changes to plans are disruptive, delaying and often adds to the costs and are therefore often resisted. The opportunity for the EIA to have a positive influence on the project is therefore lost.

- The synergic impact of different development projects in the same spatial dimensions are ignored.
- There is no post-auditing or monitoring due to shortage of manpower and capabilities of the relevant responsible agencies, resulting in the wilful disregard of the requirement of the mitigating measures and the verification of prediction of impacts. In such circumstances approved EIAs are seen as licence to do environmental damage.
- There is no attempt to consider alternative sites, designs and strategies and detail economic analysis of the cost and benefits of impacts and the projects are seldom carried out.
- There is a lack of participation of all parties in the EIA.

EIA should be incorporated early in the formulation of ICRM policies, plans and programmes, so that negative and positive impacts are assessed for the whole ecosystem and projects can be assessed early, even before the detail design of the project. A comprehensive EIA should be applied to the local and regional programme rather than to individual projects. As DOE does not have the capacity and the capability to assess every project proposal, the proposed approach will assist to lighten the load of DOE officers.

Inadequacy of Legislation

There is as yet no legislation which singles out the coastal zone as an area for integrated development and management in Malaysia. Nor is there a single body or legislation which has responsibility and comprehensive mechanism for the effective coordination of all the various laws and jurisdiction pertaining to development in the coastal zone.

The Federal Government can make laws with respect to the management and conservation of resources under the state jurisdiction for purposes of uniformity of law and policy. These laws however will not be operational in the states until they are formally adopted by the State Legislature. States are often slow in adopting or complying with such laws. For example the Land Conservation Act 1960 has yet to be adopted by the individual states. Within the federal and state legal framework different resource agencies apply their laws over the same spatial dimension leading often to conflicting use of resources (EPU 1992). Environmental criteria and the objective of sustainable development and management are also not incorporated in the laws pertaining to various resources.

There is therefore an urgent need to revise these laws with the incorporation of environmental criteria to ensure the promotion of the common objective of sustainable development and management of resources. In a country like Malaysia where economic development is rapid and corporate sector interests are inclined towards short-term gain as opposed to long-term sustainable developmental benefit, there is a need for the efficacy of laws to ensure compliance with management objectives. A good example is the non-compliance by all sectors - private and public - and government agencies of the General Circular No. 5 of 1987 issued by the Prime Minister's Department for the control of erosion in the development of coastal areas.

PERSPECTIVES FOR INTEGRATED COASTAL RESOURCES MANAGEMENT IN MALAYSIA

The ASEAN-US ICRM Plan project in South Johore was a unique experiment by a dedicated multidisciplinary team of resources managers, administrators and scientists from state and federal agencies and five local universities (Ch'ng 1989). In close collaboration, consultation and systematic research effort and plan formulation, this team under the zealous leadership of a project coordinator evolved a viable and implementable ICRM plan for South Johore, a model for other states to emulate.

Presently, a grant attached as a proviso to a loan to undertake coastal erosion control by the ADB, is being used to formulate a national ICRM plan for Malaysia. The experiences learned in the South Johore project will be useful in the formulation of the national plan.

For Malaysia the important elements in a national coastal resources policy are:

- To establish the philosophy, the overall goal and the strategies for sustainable management and development of the coastal resources;
- To establish a workable and strong mechanism for coordination, integration and cooperation horizontally between the various sectors, private and public, and vertically between the federal and state and the local government;
- A legal framework which will make explicit the policy and its objectives and the scope, approach, organisation and management protocol for ICRM;
- Clear assignment of responsibilities and designation of a lead agency at the federal, state and local authority level for plan formulation and implementation;
- To define the boundaries;
- To identify the issues and establish guidelines for their management;
- To define the resources and services required in terms of budget, manpower, equipment and finance for enhancing capabilities in plan formulation, review, monitoring, implementation and enforcement.

In Malaysia there already exists in the constitution the legal framework and institutional mechanism for coordination both at the national and state and local level for development and conservation of the natural resources and for the control and promotion of local government. The National Coastal Resources Policy will need to formulate a scheme to use this framework as a mechanism for integration and coordination.

Establishing and implementing ICRM plans in Malaysia presents major challenges to the GOM. The prerequisites for successful plan formulation and implementation are there as shown in the South Johore project. What is required is the skilful and dedicated cultivation of a new approach in planning and, most importantly, the understanding of the issues involved.

REFERENCES

- ASEAN Environment Programme (ASEP) 1989, *Phase III of the Regional Collaborative Programme of the ASEAN Countries*, prepared with the assistance of UNEP regional Office for Asia and the Pacific and the ASEAN Secretariat.
- Bakar, A. J. 1991, 'Global, Environmental Issues in Regional Perspective', Keynote address at the International Conference on Solid and Hazardous Waste Management, Singapore, 27 June, 1991, pp. 6.
- Carpenter, R. A. & Maragos, J. E., (eds) 1989, *How to Assess Environmental Impacts on Tropical Islands and Coastal Areas*, A training manual prepared for the South Pacific Regional Environment Programme (SPREP), The Environment and Policy Institute, East-West Centre, Hawaii.
- Ch'ng, K. L. 1989, 'Integrated Coastal Resources Management Plan: A First for Malaysia', in *Proceedings of the Sixth Symposium on Coasts and Oceans*, American Society of Engineers, New York. pp. 2177-2191.
- Ch'ng, K. L., Christy, T., Chua, T-E., Garces, L. R., Sadorra, M. S. M., Burbridge, P. R., Scura, L. F. & Tarnas, D. (eds) 1992, *The Coastal Resources Management Plan for South Johore, Malaysia*, ICLARM Contribution 782, pp. 3-36.
- Chong, A. L. 1990, *Socio-Economic Impacts and Policy Responses Resulting from Climate Change: A Regional Study in Southeast Asia*, Malaysian report prepared as part of a joint study by Indonesia, Malaysia and Thailand, produced by the Malaysian Meteorological Services.
- Chou, L. M., Chua, T-E., Khoo, H. W., Lim, P. E., Paw, J. N., Silvestre, G. T., Valencia, M. J., White, A. T. & Kong, P. K. (eds) 1991, *Towards An Integrated Management of Tropical Coastal Resources*, ICLARM Conf. Proc. 22, pp. 279-285.
- Chua, T-E. & Scura, L. F. (eds) 1992, *Integrative Framework and Methods for Coastal Area Management*, ICLARM Conf. Proc. 37, 169 pp.
- Clark, J. R. 1992, *Integrated Management of Coastal Zones*, FAO Fisheries Technical Paper 327.
- Department of Environment (DOE) 1993, 'Protection of the Marine Environment in the Straits of Malacca and Singapore', presented at the 18th Meeting of the Tripartite Technical Working Group, 25-27 February, 1993, pp. 5.
- Economic Planning Unit (EPU) 1985, *National Coastal Erosion Study, Phase I. Final Report*. Stanley Consultants Ltd., Moffatt & Nichol Engineering and Jurutera Consultant (S. E. A.) Sdn. Bhd., Malaysia.
- Economic Planning Unit (EPU) 1992, Reports of the three Technical Working Groups on National Coastal Resources Policy, Unpublished.
- Teh, T. S. 1989, *Effects of and Responses to a Rising Sea: A National Assessment for Malaysia*, A report submitted to the Centre for the Coastal and Environmental Studies, Rutgers, The State University of New Jersey, USA.

