

# Executive summary

This GIWA report presents the results of Scaling, Scoping, Causal chain and Policy options analyses conducted for the GIWA region 54 South China Sea region in 2001-2002. The South China Sea region contains nine nations; China, Vietnam, Cambodia, Thailand, Malaysia, Singapore, Indonesia, Brunei and the Philippines. This Large Marine Ecosystem and its catchments are bounded to the west by the Mekong River (GIWA region 55), north by East China Sea (GIWA region 36), east by the Sulu-Celebes (Sulawesi) Sea (GIWA region 56) and Small Island States (GIWA region 62), and south and southeast by Indonesian Seas (GIWA region 57). The assessment determined that the most severe environmental issues facing the South China Sea include:

- Suspended solids resulting from deforestation and agriculture in hundreds of watersheds;
- Habitat loss and modification, through massive deforestation and associated siltation, conversion to agriculture and other land uses (freshwater, coastal and estuarine habitats) and destructive fishing practices (coastal, estuarine and marine habitats);
- Overexploitation and destructive fishing practices.

Priority environmental and socio-economic concerns are Unsustainable exploitation of fish and Habitat loss and modification. Pollution and Freshwater shortage are of secondary environmental and socio-economic concern, with Global change presently of tertiary importance.

The present human population of the region is approximately 350 million, and future scenarios suggest an overall human population increase of approximately 2% per year. There is expected to be increasing urbanisation and reliance on extractive industries (mining, plantation agriculture, forestry and industrial fishing), although there will be considerable variation in sectoral changes among the nations. There is already widespread overexploitation and use of inappropriate technologies, raising serious concerns as to even the medium-term sustainability of the production systems.

At the time of the assessment, many of the relevant laws and regulations were not well accepted and there was little effective implementation. This was compounded by insufficient capacity for effective alleviation, which was, in part, related to currency depreciation, shifts in government spending and difficulties in establishing strong multilateral support for large-scale interventions.

Total pressures are likely to increase moderately to 2020, being driven by the continued population growth. This is expected to cause significant deterioration in environmental and most socio-economic aspects of international waters in the South China Sea region. The rate of deterioration will be contingent upon the success of improved regulation and ongoing and future planned interventions. Priority concerns for the future are the same as those for the present, Unsustainable exploitation of fish and Habitat and community modification.

The Causal chain and Policy options analyses focused on the linkages between habitat loss and unsustainable exploitation, particularly the environmental and socio-economic impacts, causes and policy options of overfishing and destructive fishing practices. Environmental and socio-economic impacts are as follows:

- Loss and fragmentation of mangrove forests from development, including massive conversion for aquaculture;
- Loss and fragmentation of coral reefs from coastal development, sedimentation and destructive fishing;
- Loss and fragmentation of seagrass areas;
- Reclamation of wetlands for urbanisation, industry and agriculture;
- Conflicts among villagers and outside fishers;
- Injuries to fishers;
- Changes to market prices.

The following immediate causes are identified in the analysis:

- Urbanisation and industrial development;
- Expansion of mining activities with coastal run-off;
- Deforestation of old growth forests for settlement and agriculture;
- Expansion of fisheries, including the use of destructive methods, and development of aquaculture.

The identified root causes behind habitat modification and overfishing in the South China Sea are:

- Economic:
  - Economic growth;
  - Overcapitalisation;
  - Foreign aid;
  - Market demand;
  - Export pressures for forest products - building materials;
  - Export pressures for fisheries products, aquarium trade and alien species.
- Political:
  - Military influence.
- Demographic:
  - Overpopulation, particularly among poor coastal communities;
  - Urban migration;
  - Poverty and limited access to alternative livelihoods.
- Knowledge:
  - Perpetuation of environmentally damaging traditional practices;
  - Lack of awareness of environmental change.
- Governance:
  - Lack of political will;
  - Poor governance;
  - Inadequate regulation;
  - Multilateral/inter-sectoral disputes.

The policy option analysis was greatly complicated by the complex interaction of national and regional jurisdictions and the different socio-cultural and religious beliefs, including widely differing views on family planning. There are also many transboundary issues that remain unresolved due to the aftermath of regional conflicts, colonial heritage and international political affiliations. In this regard, the implementation of improved policy can only succeed with the following support structure in place:

- Consolidation of national laws and multilateral agreements to encompass all sectors;
- Improved coordination in management across sectors and levels of governance (local/provincial/national/multilateral);

- Ongoing and expanded community education programmes;
- Improved options for the generation of alternative income/ ecologically sustainable livelihoods for the burgeoning poor coastal populations, particularly among the fisheries sector;
- National and international surveillance strategies, with participation from all levels of government, IGOs, NGOs, and local communities;
- Much-improved enforcement supported by stronger legal penalties;
- Improved transparency in governance and policing, with stronger anti-corruption legislation and enforcement.

This framework is crucial in bridging the gaps between policy formulation, development of legislation and enforcement of regulations. Five recommendations and eleven strategic actions relevant to implementing immediate interventions are proposed.

Policy recommendations include the development or expansion of:

- Bio-physical (biodiversity) and socio-economic research focused on improving management effectiveness and efficiency;
- Functional, integrated networks of marine protected areas founded on the above research and with strong co-management focus;
- Sustainable livelihoods;
- Information, education and communication networks;
- Institution and capacity-building, including establishment of inter-governmental mechanisms.

Key strategic actions include:

- Prioritisation of key data and information required for developing and refining policy, legislation and interventions;
- Building or expansion of partnerships at local, provincial, national and multilateral levels, in governments, IGOs, NGOs, and the private sector, in research and development and implementation;
- Ensuring equitability and ecological and economic sustainability in future resource exploitation, including protection of intellectual property and traditional knowledge;
- Gathering responsible fisheries authorities together with expertise from national and international academic and research institutions to adequately assess the state of fisheries in territorial waters;
- Developing regional agreements on providing MPAs within territorial waters to help ease the pressure on sites that are heavily overfished;
- Developing national coastal management plans to underpin these regional MPA agreements (even if MPAs will remain elusive for contested areas);

- Promoting a united call to establish a regional database and monitoring that allows for periodic assessments of key coastal ecosystems;
- Banning further conversion of wetlands, estuaries and mangroves into man-made facilities;
- Establishing protocols to assist national environment ministries to determine carrying capacities of estuaries for extensive and intensive aquaculture facilities (e.g. through SEAFDEC);
- Providing concrete mechanisms to engage IRRI and FAO to provide organic farming protocols for adoption by small-scale farmers and multi-national food companies to address impacts caused by nutrient loading from agriculture;
- Identifying low-cost sanitation technologies, to address domestic sewage inputs, that can be maintained and established in both rural and urban settings (e.g. through the Water Group of the World and Asian Development Banks).

Initial steps towards implementing some of these policy recommendations and strategic actions are already under way, with a World Bank/GEF International Waters project currently being implemented in the region. A 'critical mass' of expertise and a framework for change are developing, involving science, policy, private sector and government, but there is a need to better integrate water-related sectors in policy planning and legislation. In particular, the key linkages among food security, poverty, natural resources, environment pressures, market forces and governance need to be addressed.

Development and population policies in some countries require urgent review if growth over the next several decades is to be managed effectively and the present rapid rate of increase of impacts is to be curbed. There is misallocation of significant amounts of local and international funds, and better allocation and use of government funds and continuing international assistance are urgently required to redress these spiraling impacts. The rapidly changing global situation will cause changes in funding priorities, requiring more efficient allocation of funds to work towards improving future scenarios. Given that the region, with its neighbours Sulu-Celebes (Sulawesi) Sea and Indonesian Seas, lies at the global centre of biodiversity, these findings are of critical international significance.