

## MANAGEMENT TOOLS TO TACKLE COASTAL POLLUTION IN THE GULF OF THAILAND

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Both land-based and sea-based activities are major pollutant contributors in the Gulf of Thailand, and from both point sources and non-point sources. Municipalities, industries, and agriculture discharge treated and untreated wastes into nearby waterways or reservoirs. The wastes, however, eventually reach the sea via rivers and canals. These can result in significant BOD and nutrient loading in the Gulf, especially near the four major rivers in the Upper Gulf, and consequently cause a variety of water quality problems. Red tide have increasingly occurred in the recent years. The incidents occasionally impair marine water quality and affect coastal aquaculture and marine organisms.

It is evident that the country has suffered environmental management problems due to the non-strict enforcement and the inefficient cooperation among public and private institutions. Nonetheless, organized water quality management projects have been initiated to tackle the array of these problems. For example, the management for the entire watershed is approached instead of river by river management to control both point sources and non point sources. Concept of carrying capacity for receiving pollutant loads in accordance with ambient and effluent standards is essential to resolve the pollutant accumulation in the environment and the conduct of environmental risk assessment is needed to protect marine life and human health. The Thai government has tried to make other point sources (i.e. fish pier, shrimp and pig farms) mandatory to control their wastes. The Swine farming effluent standard has been recently established in line with the formulation of the drafts for the effluent standards of coastal aquaculture and fish pier activities, including the implementation of best manufacture practice for shrimp farming in Bangpakong river basin. To get public a better idea of the state of the marine water quality, the Marine water quality index has been developed. In addition, Beach Index initiated to assess tourist beach status and boost local income is established to increase public awareness, and local participation for a sustainable development. Though, more comprehensive coastal rehabilitation programs for sustainable management still need to be promoted and implemented.