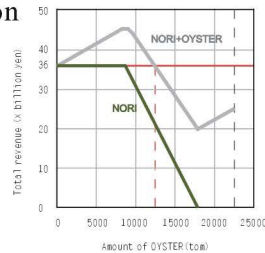


increasing but has now plateaued. Red tides in summer, however, cause anoxia and shortage of nutrients for “Nori” in winter. It has been assessed as receiving less, at least not more, nutrients and organic substances than in the past, no signs of rehabilitation have appeared in the bay. For recovering marine catches in the bay, there have been efforts to reduce pollutant load on the processes of generation, transport, and discharge of each pollutant, to control the catch by fishermen, to develop technologies, and to manage social systems on rehabilitation of the bay. In order to develop and apply new technologies and/or new systems for the rehabilitation, the most important item which has to be considered is the flow of nutrients, that is, food chain. As a technology to rehabilitate Ariake Bay, we propose the introduction of oyster cultivation including oyster bed to control the growth rate of phytoplankton. The procedure to develop the technology we have already taken is as follows:

1. To understand physiological characteristics of the oyster,
2. To understand relationship between the oyster and marine environment,
3. To establish a model to assess the growth of oyster which is competitive with “Nori” through phytoplanktons,
4. To secure a certain income for fishermen by cultivating oyster and “Nori” at the same time.

The conclusion obtained in our study is shown below. The cultivation of oyster could reduce the growth of phytoplanktons up to 8000 ton without any damage to the cultivation of “Nori.” The income of fishermen increases at the amount. When the cultivation of oyster increases to 12500 ton, the increase of income by oyster balances the decrease of income in “Nori.” The appropriate production of oyster is 8000 ton/year.



National initiative on environment management in coastal area of Korea

Won-Keun CHANG

Korea Maritime Institute E-mail: wkchang@kmi.re.kr

The Korean coast, with fascinate landscapes and vibrant ecosystems, has been enduring intensive coastal developments since 1970's. More than 90% of national industrial complexes have been located in the coastal area. Population growth

rates of highly developed coasts are often three times higher than that of inland. Annual pollution load to the coastal area has increased 40 percent since 1990's; coastal wetlands were decreased 20% from 1987 to 2005; overall water quality conditions have been degraded by pollutants deposited by or discharged from inland as well; and massive harmful algal blooms (HABs) would lead to low oxygen levels in the water, fish kills, and economic losses. These coastal environmental issues resulted in raising public awareness on marine environmental protection.

To address coastal pollution issues, especially those of water quality, Korean governments initiated the National Clean Water Action Plan in 1995; with 4 billion USD investments, 205 wastewater treatment facilities were built in coastal area. And the National Plan for Marine Environmental Conservation was launched since 1996, providing national comprehensive framework for managing coastal environment systematically. Total pollution load management system (TPLMS), same as Total Maximum Daily Loads Program in USA, was introduced in the Masan Bay Special Management Area in 2008.

Recently Korean governments try to expand their management capacities to restore coastal ecosystems by enactment or amendment of relevant laws: Law on the Conservation and Management of Marine Ecosystem, Public Waters Reclamation Act, Coastal Management Act, and Marine Environment Management Act, etc.

Marine protected area network design ecological and socio-economic considerations and constraints in Thai Andaman coast

Md. Zakir HOSSAIN ^{1*}, Nitin K. TRIPATHI ² & Wenresti G. GALLARDO ¹

¹ Integrated Tropical Coastal Zone Management (ITCZM), School of Environment, Resources and Development (SERD), Asian Institute of Technology, P.O. Box # 4, Klong Luang, Pathumthani 12120, Thailand
* E-mail: st100267@ait.ac.th

² Remote Sensing and GIS, School of Engineering and Technology (SET), Asian Institute of Technology, P.O. Box # 4, Klong Luang, Pathumthani 12120, Thailand

Literature suggest that Marine Protected Area (MPA) Network or Network of Marine Reserves provide a framework that unifies the central aims of conservation and fishery management, while also meeting other human needs such as maintenance of coastal water quality, shoreline protection, education, research and recreational opportunities. In regard, some of the pioneer