Integrative Environmental Planning and Evaluation System to Design Environmental Policy and Technology Scenarios for Asian Metropolitan Cities

Principal Investigator: Tsuyoshi FUJITA
Institution: National Institute for Environmental Studies (NIES)
Onogawa 16-2, Tsukuba, Ibaraki, 305 Japan, Tel: +81-29-850-2119, fujita77@nies.go.jp

Cooperated by: NIES, Toyo University, Keiko University, The Institute for Global Environmental Strategies (IGES)

[Abstract]

Key Words Natural Symbiosis, Integrative Assessment of Water, Resource and Energy, Technology and Policy Scenarios, Circular Economy

The NICE model was applied to the Biliu River catchment, Northern China, in order to evaluate how the environment changes after the completion of Biliu Reservoir, and how the economic development affects the environmental condition in the area. Moreover, the NOAA/AVHRR satellite image analysis was conducted in order to evaluate whether the simulated result was related to the environmental degradation in the downstream of the catchment. The statistical analysis of decoupling factor in the Dalian City based on the simulated result of water carrying capacity was carried out to evaluate the urban stress instead of the economic development. These methods to assess the interaction between the water source area and the water demand area are very effective to help decision-making on sustainable development in the catchment. The environmental efficiency was evaluated in scenarios of introducing the water treatment technology system in Kumamoto prefecture.

Macro Inventory model and distributed Inventory model were developed to estimate water pollution load around Changjiang river basin area, based on the geographic information system. Especially, 7 crop farming sectors and livestock farming sectors were added to improve the accuracy of estimation of water pollution discharge from non-point source, as it is said that non-point source from crop farming and livestock farming is the major factor in the area. The lessons were shown for the existing regional intercity networks for sustainable cities in Asia, presenting the ideas on how to develop and utilize the existing networks more effectively. A review reveals that the network contributed to the mutual reference and learning of environmental policies and experiences among participating cities. Mayoral support, as well as coordination and networking by individuals and organizations within or outside the local governments, facilitates practice adoption and diffusion through an international network. The secretariat of a regional network could improve the outcome such as mutual learning and business development by properly understanding the particular needs of participating cities;

providing them with useful opportunities; and nurturing ownership and commitment.

Quantitative evaluation procedure of environmental effects is developed as well as core indicators and several numerical evaluations are provided. Evaluation process is developed to apply the technology inventory data with their locational information for the regional GIS data base. Disaggregated area-scale databases established on GIS are used by integrating the socio-economic statistical data with basic geographical information such as municipal borders and transportation networks.