WG2: Mega Cities in the Coastal Zone

Mega cities differ from smaller urban areas not only in population size but also in the scale of economy, infrastructure and etc. These factors have regional and/or global impacts on water environmental issues. These impacts are especially significant in Asia due to its huge population, rapid economic development and intensive urbanization. The following aspects related to the impacts of mega cities need to be addressed:

- Water supply and water security. Local authorities and engineers might focus on supply solutions to water crises or security, ignoring environmental, economic and social policies associated with water management, and this is especially true in the case of the developing countries. The change of approach from water supply to water demand leads to a new concept of adaptive management, which could improve water security, water use efficiency, equality, and ecological environment as in the cases of Calcutta and Jakarta Metropolitan Area.
- Groundwater problems. Since Mega Cities are mostly located in the coastal zone where the interactions of groundwater and seawater, and nutrient transfers to the sea are rather active. Quite a lot of nutrients might pass through to the sea by submarine groundwater discharge (SGD). Urbanization changes not only groundwater flow systems but also mass transfers. Sewage, abandoned landfill, and waste dumps were found to be main factors related to groundwater pollution in Karachi and the metropolitan Seoul area. Over pumping of groundwater in the coastal zone could result in seawater intrusion.
- Environmental issues. Environmental characteristics in terms of major ion or trace metal were found to be associated with development stage or levels of urbanization within a mega city. The nutrient levels in the reservoirs, which Istanbul depends on for water supply, was found to correlate to the levels of development, e.g., population density, industry, urban land use within the watershed. Actually, the relationship between development stage and water problems of mega city is an interesting topic for comparative study in Asia or between Asia and Europe. Urbanization was an important cause of eutrophication in metropolitan Melbourne, Australia by assessing benthic algal biomass. Changes of flux of vapour and CO2, and temperature field (heat island) are another concern with high priority.

The purpose of this working group is to bring together scientists, policy maker and municipal administrators to address water problems of mega cities in Asia with a global perspective based on a hotspot study area approach. The study themes of this working group fall in the science framework and implementation activities of both LOICZ (Land-Ocean Interactions in the Coastal Zone) and GWSP.