Groundwater Sustainability in Asian Cities

First Regional Workshop on Groundwater Sustainability in Asian Cities at Asian Institute of Technology, 16-17 January, 2014, Bangkok, Thailand

About the Project

The project "Enhancing the groundwater management capacity in Asian cities through the development and application of groundwater sustainability index in the context of global change' is jointly managed by Asian Institute of Technology (AIT), Institute for Global Environmental Strategies (IGES), the International Research Centre for River Basin Environment (ICRE) with a financial support from Asia-Pacific Network for Global Change Research (APN). The project aims to assess the groundwater situation of selected Asian cities and to develop the capacity of groundwater managers and researchers through the development and application of 'groundwater sustainability index (GSI)'.

Key Outcomes

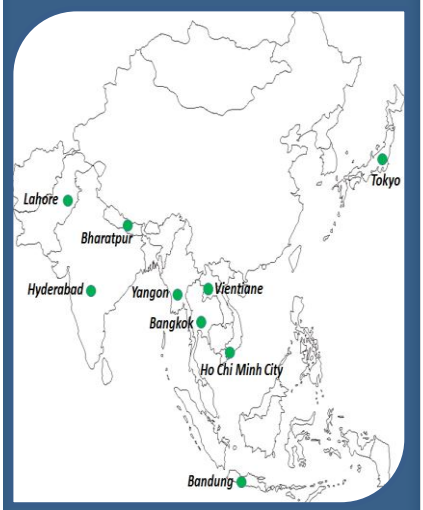
- Developed a conceptual framework for measuring groundwater sustainability in cities.
- Enhanced the understanding on status of groundwater development and use in each city.
- Enhanced networking among academics and decision makers for better groundwater management.

Project Objectives

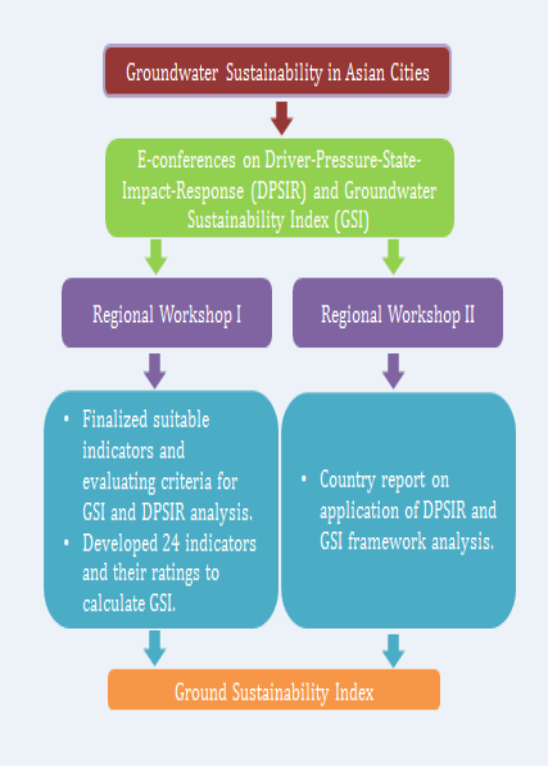
- Development and application of groundwater sustainability index (GSI) to assess the extent of use and development of groundwater resources in selected Asian cities.
- Enhancement of the understandings and capacity of groundwater managers and relevant stakeholders to assess groundwater sustainability by involving them from the beginning of GSI development, customization and application in their respective cities.

Project Partners

"Many Asian cities rely heavily on groundwater for domestic and industrial uses and economic development. The dependency on groundwater is more than 50% in some cities."



Project Methodology



Classification of 'GSI'

The GSI index is classified into categories i.e. highly sustainable, if GSI > 800; sustainable if GSI ranges from 600-800; medium sustainable if GSI falls within 400-600; less sustainable when the GSI ranges from 200-400; and non-sustainable when the GSI < 200.

Cities	Groundwater sustainability
Bangkok	Medium sustainable
Chitwan	Sustainable
Ho Chi Minh	Sustainable
Hyderabad	Medium sustainable
Lahore	Sustainable
Yangon	Medium sustainable

"Groundwater Sustainability of selected Asian cities are found to be medium sustainable to sustainable ''

Index	Components	Indicators
Groundwater Sustainability Index (GSI)	1. Monitoring of stress on groundwater	Per capita renewable groundwater resources
		Density of groundwater observation wells
		Frequency of groundwater observation
		Groundwater quality parameters monitored (physical, chemical & microbial)
		Concentration of most frequently observed & significant pollution parameter [for e.g. (NO_3-N) (%age of sample that comply with WHO guideline)
		Rate of land subsidence
	2. Knowledge Management	Basic hydrogeological map of aquifers layers
		Zonation of groundwater potential areas (groundwater use point of view)
		Delineation of groundwater critical zones (groundwater protection point of view)
		Existence of an unit for groundwater data compilation, storage, & management
		Access to groundwater-related data/information
	3. Policy & Legislation	Groundwater management policy/action plan
		Groundwater licensing
		Economic instruments
	4. Stakeholder's Participation	Level of awareness
		Availability of community groundwater management organizations
		Gender inclusiveness in groundwater development and management
		Recognition of 'stakeholder's participation' in policy/law
	5. Institution & Capacity	Groundwater overseeing authority at national level (for e.g. Ministry)
		Groundwater overseeing authority at sub-national/local level
		Availability of physical infrastructures (for e.g. office, instruments etc.)
		Technical staffs involved in groundwater development and management

Project Team

Name	Affiliation
Dr. Sangam Shrestha	Asian Institute of Technology, Thailand
Dr. Binaya Raj Shivakoti	Institute for Global Environment Strategies, Japan
Dr. Vishnu P. Pandey	Asian Institute of Technology and Management, Nepal
Dr. Shashidhar Thatikonda	Indian Institute of Technology Hyderabad, India
Dr. Oranuj Lorphensri	Department of Groundwater Resources, Thailand
Dr. Muhammad Basharat Chaudhary	International Waterlogging and Salinity Research Institute, Pakistan
Dr. Rabin Malla	Center of Research for Environment Energy and Water, Nepal
Dr. Bui Tran Vuong	Division for Water Resources Planning and Investigation, Vietnam
Dr. Khin Kay Khaing	University of Yangon, Myanmar
Mr. Haryadi Tirtomihardjo	Center of Groundwater and Environmental Geology, Indonesia
Ms. Chindavan Souriyaphack	Department of Water Resources, Lao PDR

Contact: Dr. Sangam Shrestha, Principal Investigator
Assistant Professor, Water Engineering and Management (WEM), AIT
E-mail: sangam@ait.ac.th Tel: (66-2)-524 6055, Fax: (66-2)-524 6425