Developing a universal water resource assessment model for sustainable water security: The case of Kanagawa Basin, Japan and the Mekong River Basin

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Motivation

Water crises are proving to be a very serious issue at the global level. Addressing and resolving these problems requires developing strategies and agreements in national, regional, and global levels.

⇒ ***"Water security"*** *which seeks to resolve and avoid disputes rooted in securing water rights and water shortages, is becoming more common.*

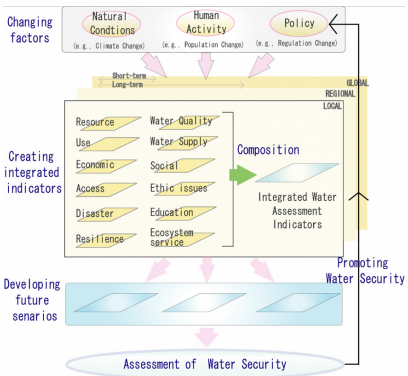
Finding countermeasures calls for comprehensively illustrating and clarifying the numerous cause-effect relationships between certain environmental conditions and their fundamental contributing factors.

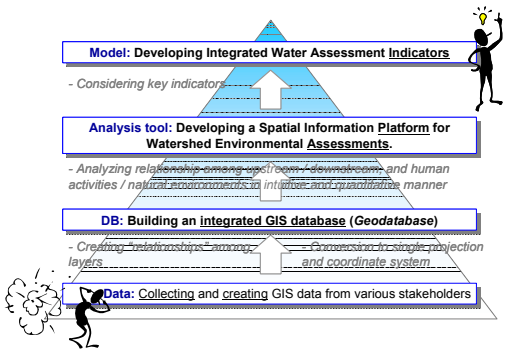
⇒ *Developing a common platform, which provides structure to the water system and relationships among various stakeholders allowing the entire picture of a problem, is required.*

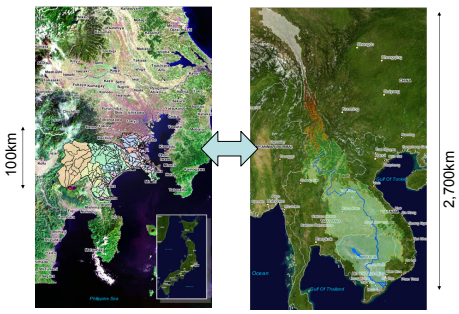
Objective

Developing Integrated Water Assessment Indicators using a Spatial Information Platform for Watershed Environmental Assessments.

- ✓ Represent water resource indicators in an integrated manner
- ✓ Quantitatively represent previously hidden relationships
- ✓ Answer questions like "What is the problem?", "Where does it happen?", and "What kind of response is effective?"
- ✓ Dynamically analyze the influences of nature, human activity and social systems.



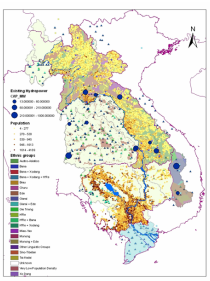




Kanagawa Basin, Japan — Mekong River Basin

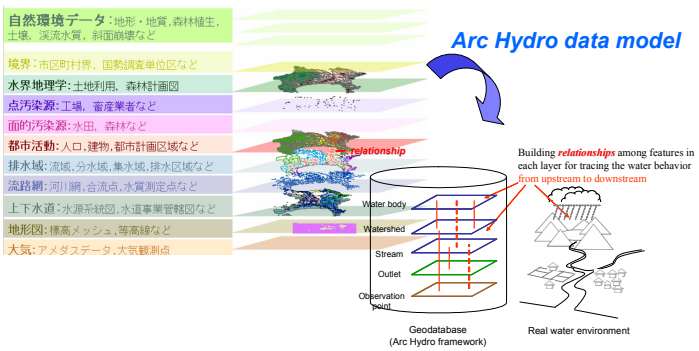
Data collection

1. Data collection from authorities and research institutes by the visitation and interview survey (Mekong River Commission, Environmental Data Center, Dak Lak Dept. of Agriculture and Rural Development, Vietnam)
2. Searching public domain datasets such as GLCF, ESRI, NIES)
3. Creating GIS layers from past data sources in UNU-AIT (Asian Institute of Technology, Thailand) studies (UNU and AIT have carried out a joint program on post graduate research in Mekong since 2004)



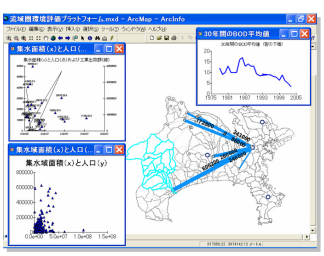
Developing database

1. A geodatabase was developed to comprehend water flow, by making relationships among individual data layers.
2. Socioeconomic data were integrated as well for interrelationship analysis among natural environment and human activities through water

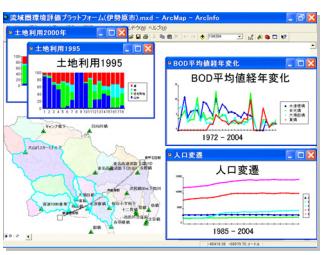


Analysis tool: a Spatial Information Platform for Watershed Environmental Assessments (Prototype)

Demonstrating on laptop!



Watershed characteristic analysis using socioeconomic data (Micro scale)



Historical analysis among water quality, landuse and population (Meso scale)

Further investigation

A multi-scale adaptation strategy is necessary for assessing the hydrological impacts of climate change on this huge transboundary river, by integrating the potential countermeasures at local, national, and at the entire basin level. We plan to develop a multi-scale adaptation framework for sustainable water resource management using spatial information technologies