ACT LOCALLY THINK GLOBALLY

Conservation, Protection and Augmenting Water Resources in Peri-Urban and Rural areas:

Towards better governance and management at local level using modern digital technologies.

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Management of Water resources in terms of managing scarcity and over-abundance as in flood situations that can lead to disasters poses multi-dimensional challenges to planners, policy makers and local government officials.

Equally so, for researchers and academics who wish to contribute to shaping public policy for better water management and in handling the Water-Energy Food Nexus in Asia

Water is both quality and quantity. Water has many dimensions, not only as a public good and private good but as public water, private water and as common property resources.

Managing this complexity of water as a resource and more so when it is entangled with social and political systems at the local level makes it even more difficult to achieve efficient water resources management.

Technology and its applications, especially the use of ICT, satellite data and IOT technologies have great potential to make a significant contributions to better and efficient management of water resources and their governance especially when they fall between urban and rural governance institutions and systems.

From a Water-Food- Energy (WEF) nexus, ensuring water for food security, supply of clean drinking water to all, managing water and sanitation in a manner so that critical water sources and resources are not threatened is vital.

Equally critical is ensuring that improper and inadequate sanitation does not damage and destroy water sources especially in peri-urban and rural areas not only during normal times but also in times of disasters such as droughts and flooding.

Filling up local water bodies with garbage especially in per-urban areas that are between the boundaries of ever expanding cities and rural areas. The critical areas for threats to water sources.

Local Water bodies are sources of ground water recharge, flood water retention areas and sources of water for local communities and can be made into areas of recreation through local resource mapping can be preserved.

Obstructions to Water flow to a Water Body

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Filling up Small water reservoirs with garbage to recover as land/real estate later?

Destruction of Village Commons and Water resources in peri-urban areas. Can they be prevented with better resource mapping using modern digital and IOT technologies?

According to UN-ESCAP sources and estimates of the Asian Development Bank (ADB), the Asia and Pacific region requires $800 billion, or $53 billion annually, in investment over the period 2016–2030 to meet water and sanitation infrastructure needs.

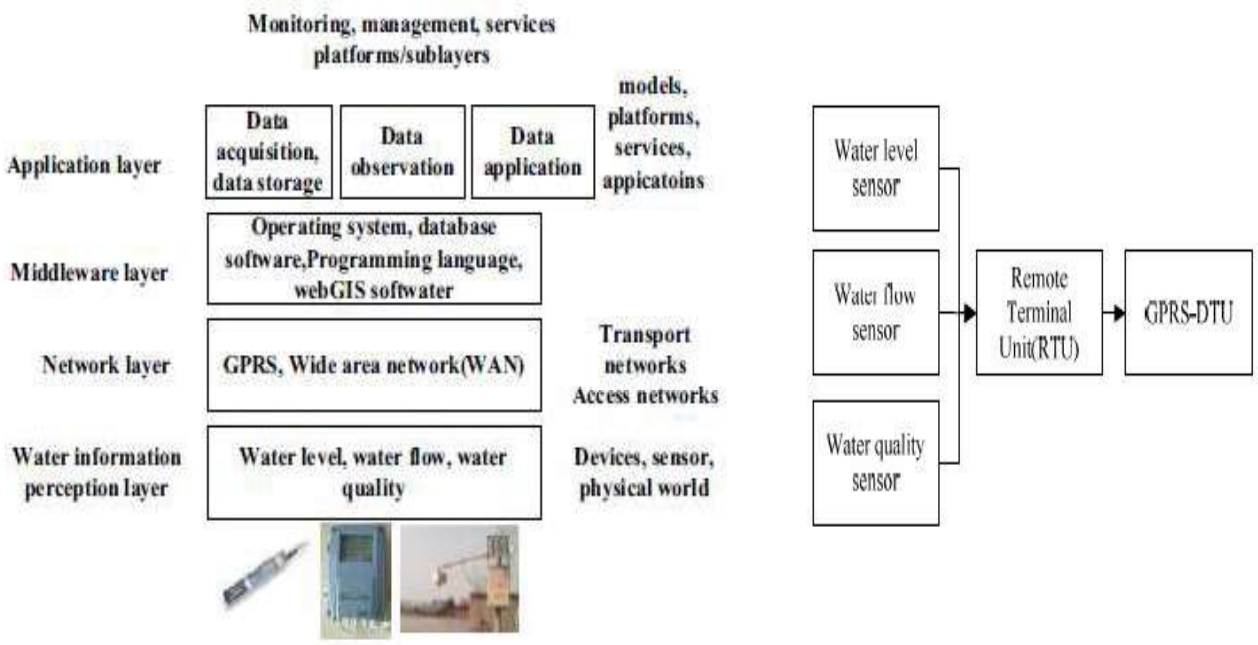
This includes the costs of climate proofing to ensure that infrastructure is resilient to the projected impacts of climate change.

This requires critically good governance and promoting good practices and accountability mechanisms at the local level.

Shaping public policy especially for local governments is necessary since national level and state level policy alone cannot address specific ecosystem conditions and local characteristics of water resources, its supply and management.

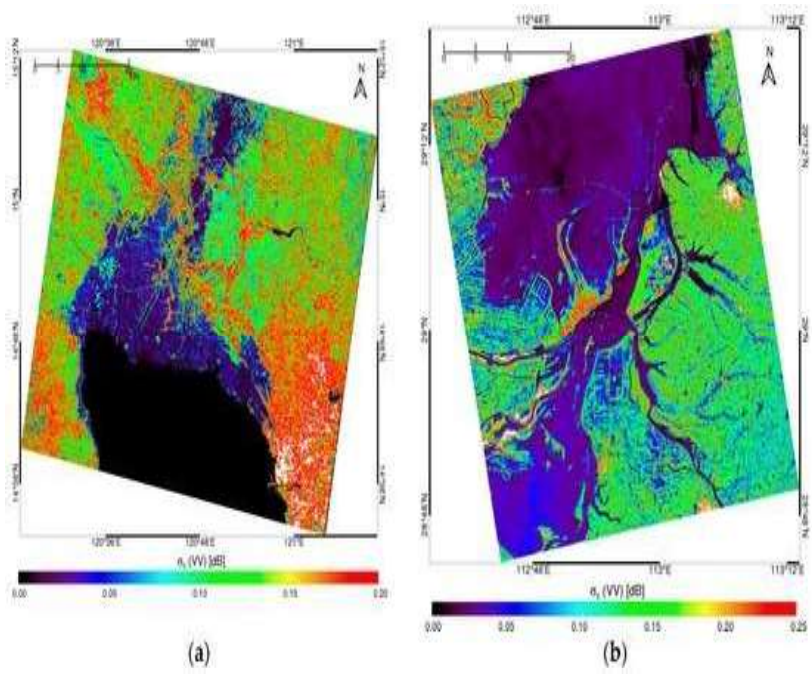
Post-disaster situations be it droughts or flood clearly show that if disaster prevention and risk reduction approaches at national level had been built up bottom up, both disasters and their after effects could be minimised.

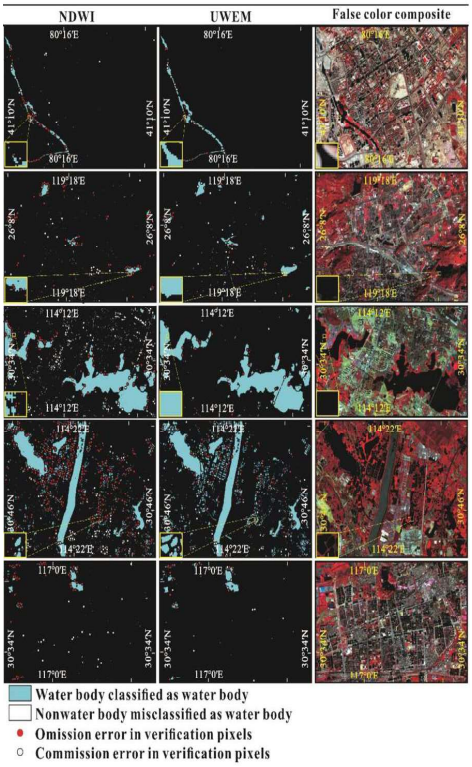
Framework Using IOT



Frame work for the Proposed system for water resource monitoring and Mangment using IoT

Such technology will be used in two peri-urban areas that are situated in dry land farming areas and one rural area in a water abundant area, in the state of Karnataka using satellite images





1. Aerial Mapping using Remote Sensing and where needed drone technology for mapping local water bodies and water ways and assess their state and measures for protection and rejuvenation. To provide such information for Public officials and departments for remedial action.
2. Microbiological parameters: basic microbiological tests should cover thermo-tolerant coliforms (a group of bacteria that grow at 44°C) and faecal streptococci. In addition, physical and chemical parameters, such as disinfectant residuals, pH and turbidity, affect the microbiological quality of water.
3. Physical parameters: in addition to turbidity, mentioned above, conductivity, colour, taste and odour might cause rejection of water.
4. Harmful chemicals: nitrate, iron, arsenic, fluoride, lead, cyanide, metals (aluminium, cadmium, chromium, copper, manganese, mercury), selenium, organics (including pesticides and disinfectant by-products), alkalinity and corrosivity.

Our paper will demonstrate how ICT, satellite image and IOT can be used for developing generic projects for other areas and developing public policy using modern digital technologies for better conservation and management of water resources.

We hope to develop a project that can benefit from partnerships with rich knowledge resources available in the work of the Water Resources System Research Unit of Chulalongkorn University and the contributions to Water Resources management made by UN-ESCAP and UNESCO.