

**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 not just quality or 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 contribution.

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. 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.

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.

For all these dimensions technology and use of technology, especially combining remote sensing technology with modern drone technologies ICT, satellite data and IOT can make a major contribution by providing a cloud based decision support system which can utilize a framework of microwave satellite observations. 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 to demonstrate how integration of such approaches using technology for policy development and management of water governance and management, can enhance efficient water use management and contribute to disaster preparedness as well. Our paper will elaborate on the field level applications of ICT, satellite image and IOT to be undertaken as well as how our work can benefit from partnerships with rich knowledge resources that have been accumulated 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.