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Integrated Rural Urban Water Management for Climate Based Adaptations in Indian Cities

State of Art Review on Integrated Urban Water Management (IUWM) Toolkits

Traditional Urban Water Management (UWM) practices and institutional set-ups have a linear focus where isolated entities manage each Urban Water System (UWS) - water supply, sanitation, stormwater and wastewater. However, this linear approach is becoming inefficient and unsustainable because of rapid urbanization and climate change as it promotes degradation of ecosystems, depletion of aquifers and pollution of water sources. An integrated, adaptive, coordinated and participatory approach is key for sustainable UWM.

The International Development Research Centre, Canada supported project Integrated Rural Urban Water Management for Climate Based Adaptations in Indian Cities (IAdapt), focuses on empowering cities to transition from traditional approaches of water management to an 'Integrated Approach' based on the principles of Integrated Water Resource Management (IWRM) and Integrated Urban Water Management (IUWM). The project is being implemented in the cities of Solapur, Maharashtra and Vijayawada, Andhra Pradesh.

The project partners ICLEI South Asia, along with Athena Infonomics, International Water Management Institute and Indian Institute of Technology Madras have conducted a review of five toolkits namely, the CSIRO, the GWP, the SWITCH, the AdoptIUWM and the IRAP toolkits. Most of them were developed under various projects during the last decade and successfully tested in cities across the globe. While some, such as SWITCH can be applied globally, others such as the IRAP toolkit are meant for defined context.

The toolkits have been compared based on the method of integration, climate change adaptation strategy, inclusion of a water balance model and opportunity for an economic analysis. With regards to the method of integration, all toolkits consider all the urban water systems. Stakeholder engagement is through creation of different platforms for the different toolkits. Climate change adaptation is integrated in all toolkits through methodologies that predict future scenarios to plan IUWM. Each toolkit provides guidance to carry out an economic analysis for implementation of IUWM. All these tools are available for use but must be selected based on the target of the IUWM initiative.

A comparative analyses of the toolkits

Name	Developed by	Year	Target Audience	Features
CSIRO	CSIRO and WRF	1998	Urban planners	IUWM strategy formulated in 3 phases that sets a strategic direction, develops a shortlist of portfolios and selects a final portfolio
GWP	GWP and the capacity building initiative in collaboration with a range of partners	2015	Urban policy and decision makers	Digital toolkit with six tools that conducts water balancing, identifies technologies, analyses and maps institutional systems and engages stakeholders for IUWM
SWITCH	SWITCH Consortium had 33 partners around the world	2006-2011	Water managers, urban policy and decision makers	Toolkit helps to plan strategically for future by engaging stakeholders and exploring water supply, stormwater management, and wastewater management options and supports sustainable decisions
AdoptIUWM	ICLEI South Asia with ICLEI European Secretariat and Association of Flemish Cities and Municipalities, Belgium	2013-2016	Indian LAs	Toolkit conducts preliminary baseline assessment, develops a vision and identifies integration targets, supports action planning and strategic prioritization by engaging with local community
IRAP	IRAP and Arghyam Trust	2010	Indian policy-makers and managers	31 tools grouped into five sets for projecting population and urban water demand, Environmental management, Capacity building, Community engagement and Governance

Implemented in	Methodology		Climate change adaptation	Inclusion of a Water Balance model	Economical Analysis of IUWM
	Engaging Government	Engaging Community			
San Francisco, Santa Clara Valley, El Paso, Canberra, Calgary	Key Stakeholder Group (KSG) set up to conduct the process	Community consulted throughout all the phases	Assesses current trends and past records of climatic conditions to make future projections	IUWM model selected by KSG	Assesses current system performance through cost-benefit analysis; conducts detailed economic analysis for final portfolio
Nairobi, Marondera	Facilitators conduct meetings and workshops with government	Platforms set up to bring local Community & technical experts together	Uses indicators to predict future pressures	Water balance tool models and assesses water flows, based on multiple and alternative service delivery strategies	Uses diagnostic tool to analyse the economics of IUWM; promotes pricing water to encourage conservation and management
Accra, Alexandria, Beijing, Birmingham, Bogota, Cali, Hamburg, Lima, etc.	Learning Alliances set up; coordinated by a focal point in local government	Network of stakeholders set up for consultation	Sets targets to reduce vulnerability and improve health of water sources	Promotes "Aquacycle daily urban water balance model"	Uses a life-cycle cost analysis in order to obtain a true economic value of an option, or group of options
Jaisalmer, Kishangarh - Rajasthan; Solapur, Ichalkaranji - Maharashtra	Nodal Officer appointed by local government for efficient engagement	Stakeholder Group set up for engagement in decision-making and implementation	Discusses impacts of climate trends on water resources	Stakeholders are free to choose suitable models for water balancing, simple tabular formats used	Analyses economic feasibility using a participatory approach & also financial sustainability of each IUWM option; cost recovery promoted through sales or private sector involvement
		River Basin Organizations set up to involve private sector; level of community participation is decided by implementers	Recommends mitigation and adaptation to water & climate disasters, considering future population scenarios	Water Evaluation And Planning System (WEAP) for simulating UWS interactions	Gives economic feasibility of various technologies



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