Development and application of Water Security Assessment Framework

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(a) Purpose of study or research hypothesis

Water security is critical for economic growth and sustainable development. This study developed an integrated framework incorporating water scarcities, risks and quality to illustrate achieving water security for all stakeholders in catchments to river basins.

(b) Key issue(s) or problem(s) addressed

Climatic variability, natural resources degradation, and conflicts are major risks to water security. The industrial and the environmental sectors face the highest risks with the increasing demand from domestic and agricultural sectors. The integrated framework illustrates how to incorporate all risks factors to achieve water security for all stakeholders at different spatial scales. The framework helps policy makers, water managers and industry to plan sound investments decisions to ensure water security for all co-dependent stakeholders.

(c) Methodology or approach used

The water security is based on the availability of acceptable quantity and quality of water supply and also on acceptable level of water-related risks to people, environment, and economic sectors. It uses water scarcities (physical and economic), quality and risks (using variability) to define and index (0-1) at different spatial level of catchments to river basins. Physical and economic scarcities are based on water footprints, water storage and available water supply. The framework assesses water security at the industry premises or catchment. The industry catchment can be a watershed, a sub-basin or groundwater development block depending on the source of water use for the industry. Interventions to increase water security depend on various dimensions (scarcities and risk) of the Water Security index.

(d) Results or conclusions derived from the project

The water security framework was applied to one industrial factory catchment in the Upper Bhavani basin, India. Results show that water security risks vary at various geographical scales and requires different interventions. Capacity building and application of framework show that it is easy to use and is replicable across geographies. The framework can be used to periodically assess water security and monitor the impact of interventions once implemented.

(e) Implications of the project relevant to congress themes

The developed framework and tool are applicable and can be used globally to plan water management interventions. This is relevant for multiple themes of congress, more specifically A, B and C.

Keywords : Water Security, Sustainable Development, Risk Assessment, Water Scarcity, Water Quality