Managing Water Scarcity: Integration of Supply- and Demand-side Options in Kaveri River Basin

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(a) Purpose of study or research hypothesis

The current paper forms part of an ongoing research study on options in water management in the Kaveri basin in South India. Kaveri river is a conflict-ridden inter-state river that flows across three riparian states of South India, Karnataka, Kerala, and Tamil Nadu. Originating from the biodiversity hotspot Western Ghats of Karnataka, the river has a catchment area of 81155 Sq.km. The unequal and unscientific water sharing arrangements between the riparian states in the river basin has made Kaveri one of the highly conflict-ridden and water-stressed basins in India.

Our primary argument in this paper is water management at a watershed/basin should focus on prioritizing the use of locally available water resources. External water should be seen as a critical supplement to local water and not as its substitute. Our key research hypothesis is that we will be able to address water scarcity in the basin by a mix of supply- and demand-side solutions. For our detailed study, we have chosen the Mandya district, which falls under the Kaveri middle sub-basin. High variability in the monsoon and unequal water distribution has left the study area highly vulnerable to external shocks. From an agroecological framework, we identify several key levers that can move water use in the sub-basin towards sustainable and workable solutions. This is the central task to be addressed in this paper.

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

We argue that the adaptation and mitigation solutions to climate change should take the watershed or the river basin as the basic unit of analysis. We base the argument on the issues identified in the study area. Assured and centralized canal irrigation has drastically altered cropping patterns in the area, moving it away from Nutri-cereals and pulses to water-intensive crops like rice and sugarcane. Poor irrigation management has led to salinity and soil degradation. Since irrigation from canals and groundwater systems accounts for over 78% of net irrigated area in the study area, demand management in agriculture is the kingpin of the strategy for addressing water problems. Building on this argument, this paper shows how Climate Resilient Agriculture (CRA) practices provide a framework to address the challenges of scarcity manifested by both natural and social causes.

(c) Methodology or approach used

Paper develops an agroecological framework for analyzing water issues in a river basin. Following a water balance approach, we estimate the crop water requirements and irrigation needs of different crops. This estimation would help us quantify the blue (irrigation) water footprint of the dominant cropping system and help develop scenarios of crop replacements.

For establishing water security and a sustainable system, we approach the study by evaluating three pillars necessary for the practice of CRA: Investments, price incentives and institutional support. We assess the distribution of water within the command area, based on the principles of CRA and environmental justice.

(d) Results or conclusions derived from the project

Results of our study have an immense bearing on water conflict situations in water-stressed basins.

Dependence on external water and move into highly water-intensive cropping systems, also aided by policy processes and perverse price incentives. Results of our study have relevance for alternative agricultural policies.

(e) Implications of the project relevant to congress themes

Traditional and agroecology-based farming in India in the past have contributed immensely towards food security. These systems are negatively affected by climate change impacts. Our paper positions CRA as the way forward in managing water scarcity and adapting to climate change. We believe the pursuit of CRA will address broader goals of SDGs, as the water systems integrate supply and demand-side interventions.

Keywords : Climate Resilient Agriculture, Agroecology, Crop Water Footprint