The Green to Blue Water Continuum: An Approach to Improve Agricultural Systems’ Resilience to Water Scarcity

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Introduction/Problem Identification

Access to green and blue water for agriculture is not simply addressed by opposing rainfed and irrigated agriculture. Indeed, agricultural systems have never been strictly rainfed or irrigated. History of Mesopotamia teaches us that even if farmers were mastering some irrigation, they were not operating under full irrigation nor were they cultivating only using rainwater. Between irrigated and rainfed agricultural, the farmers’ reality has been that they simply have never grown any crop without water, which they have stored, mobilized and applied to plants by different ways depending on the nature of the resource available. Irrigated farmers typically also use green water and rainfed farmers sometimes also use blue water, even in the absence of formal irrigation systems. In a nutshell, farmers’ reality around the world have always been to deal with a green to blue water continuum, from which they have struggled to extract the best productive value.

Analysis/Results and Implications for Policy and/or Research

The global surface under irrigation has dramatically increased since the 60’s: it practically doubled, from 160 to 300 Mha. Most policies have kept rainfed and irrigated agricultures separated, hence trying to negate the existence of this continuum. However a large majority of “new” irrigation farmers – those who were given land to irrigate and crop after the green revolution – were historically rainfed farmers, if not breeders (eg in Morocco). Or their parents and relatives were. In other words, half of today’s irrigated surface is cultivated by “traditionally rainfed” farmers.

By keeping these two agriculture types separated during the last decades, policymakers have made them both less and less resilient. Rainfed systems, because green water has become scarcer and irregularly supplied, have often become less resilient for external reasons. And irrigated systems have often become less resilient for internal reasons, which have been well documented: in a few words, the crop varieties grown under irrigation (eg rice) are less resistant to drought, whereas blue water is not provided as regularly as it should because irrigation is often badly managed and operated. Sometimes also, irrigation generates water excess that degrade soils and crop productivity. A significant part of this latter is due the lack of irrigation tradition among farmers but also in decision makers and institutions. Therefore, increasing water productivity and improving farmers’ livelihoods should not be addressed by keeping rainfed and irrigated agricultures separated, but rather by addressing the existing green to blue water continuum. Indeed most significant progress could be done by learning from each others’ resilience.

Examples from two CPWF projects are used to draw lessons in both ways. What lessons can rainfed agriculture bring to irrigation, eg in terms of resilience to long droughts, extreme events, farmers and markets organizations? What can be learnt from irrigation to improve rainfed agriculture, eg in terms of techniques of water storage and application, institutions, environmental issues, alternative income generation activities?
The IWRM for Improved Rural Livelihoods project works on a range of innovations at multiple scales: soil/water/nutrient management research at the field level; hydrogeological studies at the catchment level; climate analysis at the basin level; and analysis of institutional needs for good water governance at all levels. It seeks to help improve the livelihoods of poor smallholder farmers through an Integrated Water Resource Management (IWRM) framework that enables farmers to better cope with dry spells and droughts through improved use of water flows and better risk management. Lessons learnt for this project that would benefit irrigated agriculture are analysed and discussed.

One innovative way to improve water management in ways that can benefit the poor is the introduction of systems designed to support multiple uses: it is explored by the CPWF Multiple Use Systems project. Multiple uses of water increase the welfare of poor people in different parts or river basins – and also tends to increase water productivity. Unfortunately, most blue water supply systems have been designed with a single use in mind, e.g., irrigation or direct consumption. Not infrequently, they are simply unable to cope with the demands that may be placed on them by the multiple uses of water strategies often preferred by poor households. The answer may lie with water supply systems that are multiple-use by design. Successful examples from the project can help understand how to create more benefits from blue water. Some of them can be successfully applied to farming systems relying mostly on green water, towards the other edge of the green to blue water continuum.