

Integrated Watershed Development for Sustainable Development of Rainfed Areas

For the greater part of the world, water stress is primarily a blue water issue, and large opportunities exist in the management of rainfed areas, i.e., the green water resources in the landscape. Dr. Suhas P. Wani, Principal Scientist (Watersheds) and Project Coordinator (IWMPs), Resilient Dryland Systems, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India explains as how an integrated watershed development approach can increase the crop yields 2 - 4 times in rainfed areas.

Globally, 80% (1.25 billion ha) of arable land is rainfed with varying importance with the region (95% in sub-Saharan Africa, and 60% in South Asia) and produces most food for poor communities. These areas are the hot-spots of poverty, malnutrition, severe water scarcity, prone to severe land degradation, and have poor infrastructure.

Agriculture is the world's second largest consumer of the water after the forestry, and is also a cause of depleting soil quality. Growing need to produce more food, feed as well as biofuel for energy means increasing pressure on scarce water and land resources. Simultaneously, the per capita availability of land and freshwater has been declining since 1950 due to increased human population. These inter-linked and multiple challenges can't be solved with business as usual approach, without enhancing the efficiency of water, land and other natural resource use, without crossing the safe operating space for the humankind.

The current global population that has blue water stress is estimated to be 3.17 billion and expected to reach 6.5 billion in 2050. If both green and blue water are considered, the population currently experiencing absolute water stress is only a fraction of projected (0.27 billion), and will only marginally exceed today's blue water stressed in 2050. Large parts of China, India, and sub-Saharan Africa are conventionally water scarce, but still have sufficient green and blue water to meet the water demand for food production.

Large yield gaps with farmers' yields being about 2 to 4 times lower than the achievable yields for major rainfed crops are observed in Asia, Africa and CWANA (Central and West Asia and North Africa) regions. There is an urgent need to develop a new paradigm for upgrading rainfed agriculture and the business as usual approach can no longer achieve the goal of food security. Vast scope exists to unlock the potential of rainfed agriculture through sustainable management of natural resources through integrated watershed management (IWM) approach. The IWM approach provides a framework for



Women empowerment in a watershed, Andhra Pradesh, India

Photo: Suhas Wani

unlocking the potential of rainfed agriculture to improve livelihoods through knowledge-based and participatory method for sustainable intensification with increased efficiency of natural resource use.

The ICRISAT-led consortium developed an innovative farmers' participatory IWM consortium model that espouses the integrated genetic and natural resource management (IGNRM) approach where

Important components of the ICRISAT's New Model

- Collective action by farmers and their participation from the beginning through cooperative and collegiate mode in place of contractual mode. Participatory research and development (PR&D) approach.
- Principle of "users pay", no free rides in the program.
- Demand-driven approach, and no supply driven technologies.
- Integrated water resource management and holistic approach for improving livelihoods.
- A consortium of institutions for technical backstopping.
- Knowledge-based entry point to build rapport with community and enhanced participation.
- Tangible economic benefits to individuals through on-farm interventions enhancing the efficiency of conserved soil and water resources and targeted income generating activities for women and vulnerable groups.
- For equitable benefits to small farmers, low-cost and environment-friendly soil and water conservation measures throughout the topo-sequence.

activities are implemented at the landscape level. The entire process revolves around the four E's (empowerment, equity, efficiency and environment), which are addressed by adopting specific strategies prescribed by the four C's (consortium, convergence, collective action and capacity building).

The IWM consortium model has produced multiple benefits such as increasing crop production by 2 to 4 folds, doubling of the family incomes, increasing groundwater availability, reducing runoff to less than half and soil loss by 1/7th, conserving belowground and above-ground biodiversity, building social and institutional capital in the benchmark watersheds in India, Thailand, Vietnam, China and Philippines. The Integrated Watershed Management approach in Kothapally is revolutionizing agricultural productivity and incomes. The crops yields have increased by two to four folds as compared to the best land crop yields and have bridged the yield gap substantially.

The scaling-up of the IWM is taken up by the Government of India and other countries in Asia. Through South-South collaboration, the IWM approach is being evaluated in southern and eastern Africa through ASARECA (Association for Strengthening Agricultural research in Eastern and Central Africa).

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