

Crop Water Budgeting

Crop Water Budgeting is a farmer centric android based tool which enables rural communities to input primary information and assists them in managing their surface and ground water efficiently without depleting their resources. It generates discussions on water as a collective resource and the need for better governance.



India has been witnessing growing water scarcity over the past several decades due to population growth, industrialisation, cultivation of water intensive crops and climate change. Rising pollution of water sources is also leading to water scarcity in various parts of the country. About 600 million Indians are facing high-to-extreme water stress and the situation is set to worsen as water requirements rise (NITI Aayog, 2018).

India is one of the world's biggest users of ground water with cropping patterns skewed towards water intensive crops causing depletion of ground water. Increasing costs of deeper well drilling and pump replacement, as well as poor energy reliability have also added to farmer woes. There is an immediate need to adopt water saving technologies that can sustain our needs and conserve our already dwindling groundwater resources for the future generations.

Crop Water Budgeting is an android based tool that has been developed to assist communities manage their surface and ground water efficiently without further depleting their resources. Farming communities are at the centre of Crop Water Budgeting exercises because water availability, whether groundwater or surface, is deeply impacted by

their actions, and in turn the availability impacts their livelihoods. The effort is to build awareness about efficient demand-side management, by assisting village communities in viewing water as a Commons and taking decisions on sustained availability of water.

Crop Water Budgeting enables facilitators and community resource persons to input primary information related to rainfall, number of wells, water harvesting structures, cropping pattern etc. Depending on the input data, the tool calculates the availability of water for the crops after deducting the water requirement for domestic and livestock purposes. If there is a deficit in water availability for the present cropping plan, the community members discuss possible crop changes to avert the situation of water deficit. The exercise generates debate and discussion on water as a collective resource and the need for better governance.

How Crop Water Budgeting works?

Community resource persons along with community members collect data on existing water bodies, number of borewells, groundwater levels, changes across seasons over the years, crops grown during Kharif and Rabi and the restoration measures undertaken in their village boundary. The data is then evaluated against the scientific norms set by various agencies to estimate the water use. Once the farmers' plans for the forthcoming Rabi season have been collected, a community level workshop is organised to undertake the Crop Water Budgeting exercise. Water availability for the season is evaluated based on the recharge potential of the area while taking into consideration rainfall levels and water storage in the surface structures. This is matched against the water required for cultivation in Rabi season based on the farmers' plans. This is followed by community discussions on balancing the demand and supply side of water, aided by the facilitators providing more information on alternative crops, cropping practices and improved techniques for saving water with higher returns from crop production.

Based on water availability, farmers are expected to make changes in the crops to be cultivated, practices to be followed and adopt new techniques. The community level deliberations involve developing an understanding of issues related to farming practices and how one variable impacts the other in a causal loop. A holistic view is developed where a diverse set of parameters, including variables influencing soil productivity (soil fertility, soil erosion, degradation, soil moisture, green manure etc), factors influencing crop choice (market, domestic need, cropping rotation, yields etc), irrigation practices (traditional, technology based etc), water resources (water harvesting structures etc), pest and diseases, fertilizers, and drought, are considered.

Along with the discussions on demand side management of water, the community members are informed of various programmes, such as watershed development and Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) that can be used to augment their water resources. They are also informed about policy provisions related to managing water as common pool resources, rules and regulations supporting and restricting the use of surface and ground water and finally impressing the need for operationalisation of the rules that can determine long term impacts. The commonly agreed decisions are recorded and monitored at community level.

The benefits of adopting Crop Water Budgeting as a water management tool include an increase in the awareness level among farmers on water resources, use of water saving devices or improved irrigation systems such as drip irrigation, sprinklers etc, sharing of bore well between farmers with lands close by, possible switch from high water intensive crops to low water intensive crops or irrigated dry crops, community participation in the promotion of recharge structures and mobilising of financial resources for operation and maintenance of common water resources. And finally, the farming community being at the center of the planning and monitoring process becomes the most effective regulatory body in terms of identifying deviation and taking appropriate action for regulating themselves.



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