



## **Improving irrigation efficiency : the need for a relevant sequence of the management tools**

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With 70 % of worldwide withdrawals, irrigation efficiency is a key issue in the overall problem of water resources. Management of water dedicated to agriculture should be improved to secure food production and save water to deal with increasing domestic and industrial demands.

This paper is based on the results of a collaborative research project conducted in India with a local NGO (the Aga Khan Rural Support Programme, AKRSP(I)) during which GIS were tested. It is aimed at analyzing the efficiency of water usage in a water development programme conducted by the partner NGO in the semi-arid margins of Gujarat state. The analysis raises the question of the articulation of legal, institutional, economical, and technical tools to improve water efficiency.

The NGO supervises the construction of surface water harvesting structures for irrigation purposes. Following a participatory approach, it creates and trains user groups to which the management of dams would then be devolved. User group membership depends on financial contribution to the building costs. A legal vacuum regarding surface water management combined with unequal investment capacities favor the concentration of water resources in the hands of a limited number of farmers. This causes low water use efficiency, irrigation choices being mostly oriented to high water consumptive crops and recipient farmers showing no interest in investing in water saving techniques.

Our observations favor equality of access and paying more attention to the sequence in which management tools are articulated. On a national scale, as a prerequisite, water user rights as well as NGO's intervention legal framework should be clarified. On a project scale, before construction, information systems could help to identify all potential beneficiaries and optimize equality of access. It aims at reducing the volume of water per farmer to encourage them to irrigate low water consumptive crops and invest in water saving techniques. Depending on individual investment capacities, financial support could be proposed to favor investments in micro-irrigation devices. Finally, we suggest delaying the use of economic tools, giving up financial participation to the building costs (to limit their discriminating effect on user groups access), and limiting their applications to watering charges to cover maintenance expenses.