



Briefing Note

# Effective agricultural water management

## The background

Up to now, the increase in agricultural yields per unit of area has been the criterion used to measure the effectiveness of water management. In the past, land productivity rose considerably in the wake of the green revolution. Irrigation, in combination with high-yielding cereal varieties and increased application of fertiliser, has contributed to a doubling of cereal yields per hectare in many developing countries. Thanks to irrigation, 40% of the world's cereal crop is currently produced on just 20% of the land used for growing cereals. When water is scarce, however, water productivity becomes particularly important.

Recent food crises and climate change have once again brought water management in agriculture and rural development to the centre of international attention. Investment in this field is significantly increasing once more. The rapid rise in purchases and leasing of large areas of land in Africa is focussed primarily on irrigable farmland.

At the same time many irrigation schemes – especially large-scale projects in Africa – have attracted criticism. They are often regarded as too expensive, ecologically and socially questionable and inefficiently managed and administered. From now on, in many countries the effectiveness of agricultural water management will also have to be gauged by the extent to which it helps to limit water scarcity.

## Our position

In this context, GIZ takes the following positions:

1. **A reorientation of water management is required**

   Agricultural water management in developing countries needs to be reoriented. The foremost concern will be the latent conflict of objectives between sustainably managing scarce water resources, increasing national food production and reducing poverty in rural areas. In future it will therefore no longer be possible to measure the effectiveness of water management in agriculture solely in terms of higher production. It is also important that agricultural water management addresses livestock farming and aquaculture as well as crop production.

2. **Distributional equity is crucial**

   The way in which scarce resources are shared out harbours potential for conflict. It is important to aim for equity in the allocation of water both within agriculture and between agriculture and other sectors, such as the environment. The process must take account of existing power structures and constellations of interest, and of smallholder water users' needs.

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3. **Technology must be considered within the overall context**

   Reorientation is also called for in relation to the use of technical and technological options. The focus must be placed on the economic and regulatory requirements upon the exploitation, conservation and allocation of scarce water resources. If this is not the case, even the use of water-saving technologies such as precision irrigation can have counterproductive effects.

## Our recommended actions

Substantive reorientation of the promotion of agricultural water management in developing countries is essential. Specific measures must be carefully matched to the particular requirements and governance capacities in each case.

GIZ considers the following the most important recommendations for action:

1. **Choose integrated solutions rather than sectoral approaches**

   The growing divide between agricultural and ecological water requirements calls for a system of integrated land and water resource management (ILWRM).The prerequisite for this is a detailed survey and analysis of existing land and water resources and their current and planned future use. Integrated land and water resource management takes account of the usage requirements of various sectors in the respective catchment areas and river basins and strikes a balance between them. ILWRM links the requirements of land and water management, reconciling them at local, regional and national level. An important aspect of this is the coherence of the provisions of land and water law. The particular challenge is that considerations of the effectiveness of the agricultural water management system no longer relate only to an individual farm or business or to an individual irrigation system; instead they must be aligned with the overarching regional planning objectives and the objectives of resource management in the catchment area.

   Agricultural water management goes well beyond irrigation. In order to be able to utilise all options, more regard must be paid to rain-fed agriculture, and in particular water-saving farming methods involving direct sowing. The various methods of collecting and utilising precipitation runoff (water harvesting) and the use of flood recession farming deserve greater attention, above all in Africa. Livestock farming and aquaculture also have a vital role to play in agricultural water management, not only arable farming. Their demands on available water resources have to be taken into account.

   Marketing and issues relating to cost-effectiveness at farm and household level are also important considerations in the reorientation of water management in agriculture. The opportunities for irrigated contract farming will need to be explored in more depth. External costs that could be incurred as a result of excessive resource use or damage to soil or water must be identified. Compensation payments for resource-conservation measures in catchment areas (payments for environmental services) are becoming increasingly important.

2. **Adapt measures to available governance capacities**

   Different options for agricultural water use make different demands on water governance. For example, rain-fed farming practised by individual farmers requires little institutional control of the water resources involved, apart from restrictions on the polluting of groundwater. Individual small, decentralised systems for storing rainwater require little institutional control, whereas large programmes involving such small storage systems considerably increase the need for regulation if adverse impacts on the catchment area are to be prevented. Large-scale irrigation systems or a multiplicity of small systems in one catchment area further amplify the need for institutional control. Merely with regard to the allocation of water between different users, such large-scale or complex settings call for extensive regulation within the systems, between different systems, between irrigation and other types of use and potentially between the usage requirements of different administrative districts.

Different approaches to the management of scarce water resources also entail different governance requirements. For example, introducing and collecting water charges that are linked to the volume of water used, or rationing the allocation of water, require significantly more legal regulations and implementation mechanisms than a tariff structure based simply on area. The effective use of such revenue likewise calls for a large amount of institutional control – something that is usually considerably underestimated.

For water management in agriculture to be effective, it needs to align technical, technological and management-related approaches with each other and with the institutional capacities available in each particular situation. This type of adaptive water management is fundamental to the sustainable and effective use of available water resources. Everyone involved, however, should be aware that building capacities and introducing regulations is time-consuming.

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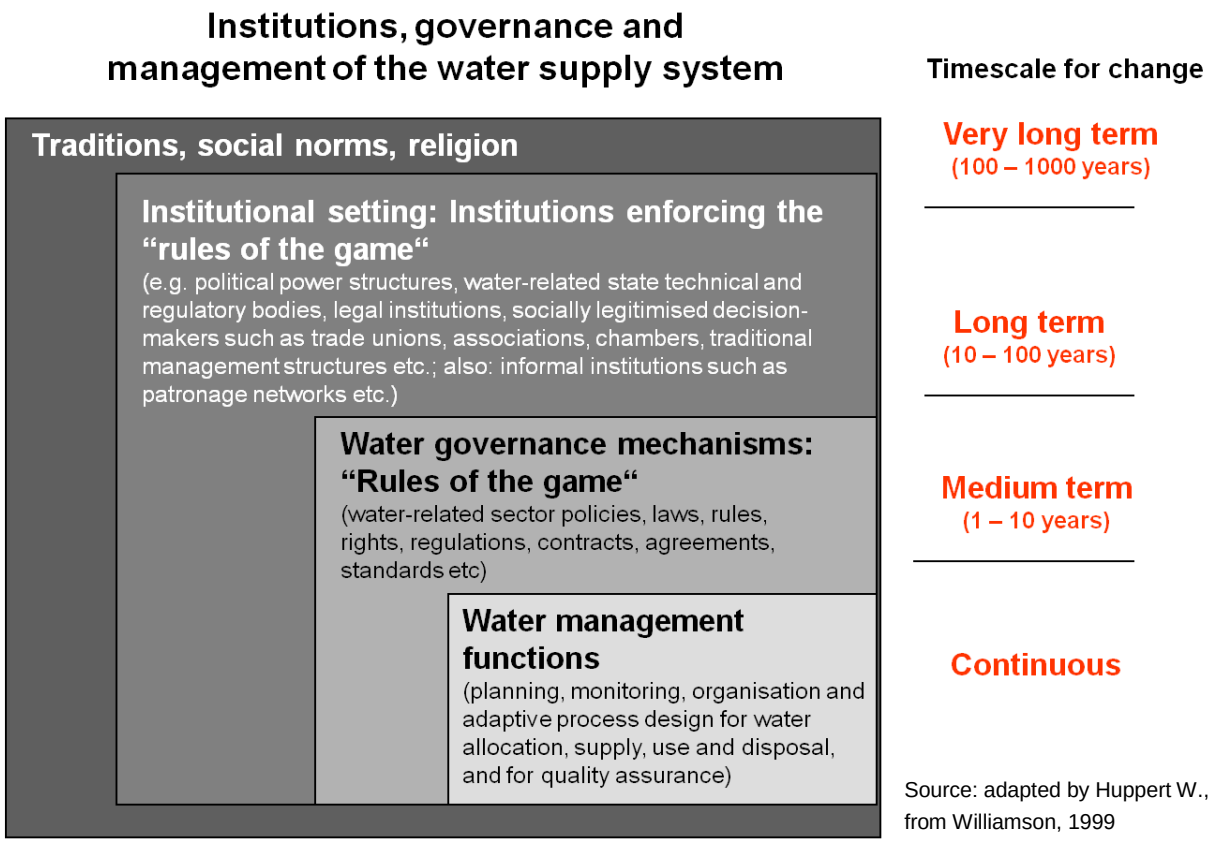
Illustration: Summary of the key aspects of water governance and the timescale for modifying them




Source: adapted by Huppert W., 2008 from Williamson, 1999

Published by:
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH
Division Rural Development and Agriculture

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February 2013