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# COLLECTIVE ACTION AND PROPERTY RIGHTS FOR SUSTAINABLE DEVELOPMENT

## Irrigation, Collective Action, and Property Rights

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FOCUS 11 • BRIEF 6 OF 16 • FEBRUARY 2004

Approximately 40 percent of the world's food and 60 percent of its grain is produced under irrigation. Between 1900 and 1950 the total area under irrigation worldwide nearly doubled, rising from about 48 million to 94 million hectares, and by 2000 it had more than doubled again, reaching 240 million hectares. This dramatic expansion in irrigated area has produced an enormous and expensive infrastructure. Governments already straining under fiscal deficits often find themselves unable to meet the costs of adequately operating, maintaining, rehabilitating, and upgrading these systems without enlisting user participation.

### SHIFT IN ROLES BETWEEN GOVERNMENTS AND WATER USERS

Governments are now shifting their role from direct management of irrigation systems to regulation of the water sector, provision of support services to water user associations, and capacity building among water user associations and irrigation service providers. During the past two decades more than 40 developing countries in Africa, Asia, Latin America, and the Middle East have adopted programs to transfer the management of irrigation systems from government agencies to water user associations. Sometimes irrigation management transfer programs have focused on organizing water user associations and assigning responsibilities to them but have not transferred appropriate property rights and authority nor provided strategic planning to change the roles and modalities of government. There have not been adequate incentives and accountability mechanisms for all parties concerned.

### STATE- AND FARMER-SPONSORED INVESTMENT

Water users are not normally active contributors to state-sponsored irrigation projects. These users usually have no sense of ownership of or responsibility for irrigation systems that are built, repaired, and staffed by governments. Since water user associations are not generally formed before construction, farmers do not participate in decisionmaking and their water rights within the irrigation system are not clearly defined. For these reasons, and because the water service is so often poorly defined and provided, farmers are unwilling to pay irrigation service fees. When governments are unable to mobilize adequate resources to finance irrigation, the condition of infrastructure and the quality of water services decline further.

By contrast, traditional irrigation systems have been developed and managed by local farmer groups in many parts of the world. In many cases such systems have been operated, maintained, and improved by local people for decades and even centuries. Research shows that a fundamental reason for their long-term viability is that they are founded on locally derived

principles of water and land rights, rules, and obligations. Water rights are often embedded in the infrastructure itself. For example, many systems use proportioning weirs—structures that divide shares of water to fields on the basis of proportional rights to water allocated by the local community. Those shares, or water rights, are often based on farmers' previous investments in collectively developing or maintaining the system. Obligations of water users are linked to property rights through community-based rules that are in turn backed by the social force of the community.

Such traditions sometimes break down in the face of state-sponsored development. In South Sumatra, Indonesia, for example, the government, with no participation from the local community, installed a water division box on a site where farmers had previously used a traditional water-proportioning weir. After construction of the new division box, the farmers promptly reinstalled their proportioning weir just below it. This case illustrates the importance of designing property rights, local institutions, and infrastructure in an integrated way.

The limitations of state-sponsored irrigation are now widely recognized. For irrigation systems to be productive and sustainable, water users must play a larger role in their governance, financing, and management. To motivate water users to act collectively in support of the system, decisionmakers must adopt democratic processes with appropriate incentives and accountability arrangements.

### PROPERTY RIGHTS FOR WATER USERS

The most important incentives for gaining the support of water user associations are clear and recognized rights over water, land, and infrastructure. The most important of these rights include the following:

- the right to use, both on individual farms and for the irrigation system as a whole, a certain amount or share of water of an acceptable quality;
- the right to cultivate land and choose what crops to plant, with collective protection against conversion of irrigated land to other uses;
- the right to use, repair, and improve irrigation infrastructure;
- the right to determine what irrigation services will be provided and by whom;
- the right to adopt rules, irrigation service plans, and budgets;
- the right to establish, collect, and use an irrigation service fee (without having to transmit the funds to the government);
- the right to assign penalties, settle disputes, and obtain legal support;

- the right to give consent to or refuse external assistance; and
- the right to maintain representation in a higher-level public council at the river basin or district level.

Agriculture and economic policies can have a profound effect on farmer incentives to invest in irrigation. In many countries, inexpensive imports, low crop prices, and high input prices result in low or nil profit margins for irrigated agriculture. This constrains the ability of water user associations to pay more for irrigation services. In some countries it may be necessary to increase the price of food crops to reflect real production costs or otherwise earmark consumption taxes to finance part of the cost of irrigation.

## SUSTAINABLE MANAGEMENT OF IRRIGATION SYSTEMS

Since irrigation systems are integrated hydraulic networks, their management should also be integrated. For medium and large-scale irrigation systems, the principle of federating local water user associations up to higher levels of the system has been adopted in several states of India and in China, Indonesia, and Mexico.

For sustainable management of groundwater irrigation, the aquifer is the unit that should be managed in an integrated way. Some pilot areas, especially in South Asia, are beginning to adopt this principle. Local associations of groundwater users regulate small aquifers or incorporate groundwater management into conjunctive management of canal irrigation systems with irrigation departments. Establishing effective property rights over groundwater can be difficult because it is often hard to measure the stock of the resource, its boundaries, and the movement of the aquifer, or the amount of water extracted.

## CONCLUSION

Increasingly, governments are realizing that motivating water users to take over responsibility for financing and managing irrigation systems requires transferring the authority to govern irrigation systems to water users as well. Governments should reorient how they relate to water user associations so that a new partnership is created to (1) empower water user associations with property rights and governing authority, (2) ensure that governments provide support services and regulate the sector at the macro level, and (3) establish cost sharing for irrigation investment. Irrigation management transfer becomes part of a more comprehensive, participatory, and strategic reform process for the irrigation sector.

International experience suggests that successful irrigation sector reform programs establish both a policy working group and a national secretariat that help to guide and coordinate the planning and implementation of the reform process. The process should include:

- strategic, participatory planning,
- research and stakeholder consultations,
- mobilization of political support,
- design and adoption of an appropriate policy, legal, institutional, and regulatory framework,
- strategy to coordinate lending and technical assistance,
- public awareness campaigns, and
- monitoring, evaluations, and course corrections.

It is ironic that the huge investments in constructing irrigation systems have not been followed with commensurate investments in sustainable management of these systems. In order to meet the growing demand for food in the future under conditions of increasing competition for water, it is vital that farmers become more active participants in governing and managing irrigation systems. ■

For further reading see A. Subramanian, N.V. Jagannathan, and R. Meinzen-Dick, eds., "User Organizations for Sustainable Water Services," *World Bank Technical Paper No. 354* (Washington, DC: World Bank, 1997); D. L. Vermillion and J.A. Sagardoy, "Transfer of Irrigation Management Services: Guidelines," *FAO Irrigation and Drainage Paper No. 48* (Rome: Food and Agriculture Organization of the United Nations, 1999); E. Ostrom, *Crafting Institutions for Self-Governing Irrigation Systems* (San Francisco: Institute for Contemporary Studies Press, 1992).

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