13 Providing Irrigation Services in Water-scarce Basins: Representation and Support

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13.1 Introduction

As water becomes scarcer, competition intensifies and its value rises; irrigated agriculture must change profoundly to use water more productively. Compounding this challenge is the widespread poverty in river basins in developing countries and the pressure this creates to reallocate water to the poor for productive uses. This chapter draws from the river basin studies in this book, along with supplementary materials, to outline the challenges facing irrigation service provision in closing river basins in developing countries and the implications this has for institutional support systems. It also addresses the adequate representation of the large numbers of small-scale water users characteristic of developing country river basins, along with other interests, in basin-level decision-making institutions.

In semiarid regions, irrigation is generally the largest water user in the basin. In the past 50 years, vast sums of money have been invested, by both governments and farmers, to construct new irrigation systems or rehabilitate deteriorating ones. The irrigated area nearly doubled from 140 million ha in 1960 to 275 million ha in 2000. In many countries, this occurred under the banner of integrated river basin development, aptly summarized as ‘the orderly marshalling of water resources of river basins...to promote human welfare’ (UN, 1970, p. 1, quoted in Barrows 1998, p. 172). In the past 15 years, governments have shifted away from irrigation infrastructure development for poverty reduction to improving irrigation management, frequently through institutional reforms such as irrigation management transfer (IMT). An overriding concern in irrigation reforms has been to reduce government subsidies to the operation and maintenance of irrigation systems, while the focus on poverty reduction through the development of large-scale irrigation has waned. Only recently has a paradigm shift started to occur in water management, based on the recognition that providing access to water for drinking and growing food, eradicating poverty, and stopping groundwater overexploitation are central challenges in river basins in developing countries that require new ways of thinking.

In the developing world, institutional arrangements for basin management are only starting to take shape and are still rather weak at a time when the management of river basins is becoming more difficult and challenging (Vermillion and Merrey, 1998). In part, this is due to the widespread trend to decentralize the management of water services, such as with IMT or to privatize urban water supply, but also because local institutions – such as water users...
associations (WUAs) – are young, weak and dependent on agencies for resources as well as technical support. While having mixed outcomes in terms of accountability and cost effectiveness at local levels, decentralization leads to a multiplicity of organizations, often with competing interests, and makes water management in river basins reaching closure more challenging. Although a large body of literature has developed on river basin management, relatively little attention has been given to the needs of locally managed irrigation and how to address water deprivation in closing river basins in developing countries. The closure of river basins (see Chapter 2) in semiarid regions poses significant challenges for pro-poor water policies. The following issues stand out:

- The over-exploitation of primary water sources (waters tapped from rivers, lakes and aquifers, i.e. ‘blue water’) leads to environmental degradation through the destruction of aquatic ecosystems, depletion of aquifers and generation of polluted wastewater flows (both industrial/urban effluents and agricultural drainage effluents). In closed river basins, the only way to reverse these trends is to consume less primary water and to make judicious use of derivative water (municipal wastewater, industrial discharges and agricultural return flows).
- Alleviating poverty through the creation of new hydraulic property (Coward, 1986) becomes very difficult as primary water sources are already fully committed, and frequently under the control of the relatively better off. Creating new entitlements for the poor must therefore be sought in renegotiating rights to primary water. Equally important is the need to increase the productivity of ‘green water’ (water stored in the soil profile) through rainwater harvesting and anti-erosion measures.
- The lack of possibilities to develop new water supplies and perceptions that agriculture is a ‘low-value’ use of water leads to increasing inter-sectoral water transfers. These are frequently one-way transfers from agriculture to industry and domestic use, as well as intra-sectoral transfers in agriculture to higher-value crops, usually grown by commercial farmers.
- Without clear water rights and effective enforcement, it is relatively easy for poor people, such as smallholder irrigation farmers, to lose access to water for production due to these transfers. Consequently, poor farmers increasingly have to turn to derivative water as their only source of water.
- Before IMT, most irrigation schemes were under government management and to a degree, protection. After IMT, this protection may disappear, and the local irrigation management entity may find itself under-represented at higher levels (Svendsen et al., 2000).

To address these issues, concerted change at different levels, building on the strengths of government, civil society groups, popular movements and communities, is necessary. Such change needs to focus on the creation of interlocking institutional arrangements at the local, meso and macro level to manage water in a socially just and equitable manner that meets the needs of the poor and ensures the sustainability of locally managed irrigation. Of special concern is the need to represent and protect the interests of water users that are at risk, such as the large number of small-scale water users that fall outside the ambit of formal water management. Furthermore, the ability of groundwater irrigators to make mincemeat of any effort towards orderly resource management at the basin level needs to be taken into account. Previous chapters of this book have analysed the institutional challenges that arise when the utilization of water nears or exceeds the annual renewable water in a river basin and how various countries are dealing with these challenges. In this final chapter, we endeavour to draw lessons from these experiences as they relate to irrigation service provision and poverty alleviation. One fundamental premise of the chapter should
be stated explicitly: in poor developing countries, it is desirable to find ways to preserve and improve irrigated agriculture, as this is a major source of livelihoods and food security for which there are few substitutes.

13.2 Challenges Facing Locally Managed Irrigation in Closing River Basins

Between the 1950s and 1980s, vast investments were made in poor countries to increase the area served by large-scale irrigation systems dependent on surface water. A central purpose of this effort was to reduce poverty and to attain national food self-sufficiency. However, starting in the 1980s, serious concerns were raised that public investments in large surface irrigation were not sufficiently benefiting poor farmers and that the government agencies charged with irrigation management were performing poorly, especially in recovering costs from farmers. To reduce the burden on the public purse, and under the influence of the structural adjustment programmes of the 1980s, the role of government in irrigation management in many developing countries started to change, with an emphasis placed on transferring management responsibilities and financial obligations to farmers. Much of this reform is captured in the phrase ‘irrigation management transfer’, though the actual reforms are broader than ‘simply’ transferring water management responsibility from government to water users. The widespread trend to devolve irrigation management to farmer organizations, coupled with the rapid increase in groundwater irrigation and water harvesting and local storage means that currently a large majority of the world’s irrigation is locally managed. A distinguishing characteristic of large portions of locally managed irrigation is that it has thin or no contact with formal resource governance structures. Examples include the 20 million people pumping groundwater in South Asia and the communities that depend on South India’s 300,000 tanks or China’s 7 million ponds.

The chapters in this book have shown that there are clear stages to river basin development related to the changing pattern of demand for water over time. A fundamental point for understanding the challenges facing locally managed irrigation in water-scarce basins is that irrigation reforms such as IMT were not enacted to deal with river basin closure but rather to reduce government expenditure. Thus, management transfer in many countries is occurring at a time when water resources in river basins are becoming increasingly scarce and the subject of inter-sectoral competition. This places an extra burden on farmers, who, while having had little time to develop their associations, immediately need to start focusing on the river basin level to secure and retain an adequate share of water. As many governments have been transferring irrigation management to user organizations rather hastily, the world’s irrigation is increasingly likely to be managed by ill-formed and ill-prepared user organizations. Where systematic efforts are not made to support newly established WUAs and secure their access to water, the sustainability of smallholder irrigation itself may come into question (cf. Shah et al., 2002). At the same time, burgeoning informal irrigation economies, unrestrained by national policies and government regulatory structures, defy initiatives for more orderly basin-level water allocation and management, and are instead driven by their own rules and internal logic.

The challenges facing locally managed irrigation in water-scarce basins are thus twofold: internal and external. This chapter mainly deals with the external challenges, as previous studies have adequately identified the internal support needs of locally managed irrigation (Yoder, 1994; IIMI, 1997, 1998; Frederiksen and Vissia, 1998; Huppert and Urban, 1998; Svendsen et al., 2000; Huppert et al., 2001). Local irrigation management entities need to focus internally on improving irrigation water management, while at the same time negotiating externally with policy makers, river basin authorities and other water users to protect their water allocation at the basin level.
They must become more outward-looking to gain or maintain access to water supplies that other sectors may try to capture. As the entities managing local irrigation are spatially dispersed and mainly focused on their own irrigation system, they need to confederate to lobby and compete at the basin level. Compounding this challenge is the declining share of the agricultural sector in many countries, and the perception that other uses of water are higher value, while the persistent dependence of a large share of the population, especially of the poor, on farming for livelihoods continues. There is growing pressure on local irrigation management entities and farmers to increase water productivity and to make the case that they are not wasting water.

The above challenges apply to both surface water and groundwater management organizations, and locally managed irrigation in upper catchments as well as newly formed water users’ organizations in large-scale irrigation systems under IMT programmes. Although this is necessarily a broad-brush approach, and the specific challenges to the myriad irrigation organizations that exist depends on many more factors than river basin closure, several common threads emerge from the analysis of the basins studied in this book.

13.3 Irrigation Service Provision in Water-scarce Basins

The challenges facing locally managed irrigation in water-scarce basins outlined above directly affect the institutional requirements for irrigation service provision. A service provision perspective on irrigation management entails focusing on the different service roles or functions performed by the multiple actors involved in water management in a river basin and the mechanisms that govern the exchange of services between them. Huppert et al. (2001, p. 41) distinguish between primary services (the provision of irrigation infrastructure and water delivery), secondary services (maintenance and operation of infrastructure) and supporting services. Of importance in irrigation service provision is the large number of actors involved, as the provision of primary services (such as water delivery to a farmer) is the result of a network of (supporting) service providers and receivers. Thus, when analysing service networks, it is necessary to look at the service relationships between actors by identifying the laws, procedures, contracts and/or common practices that are the basis for the relationship, i.e. the governance mechanisms between service providers and receivers. Analysing service arrangements, whether highly formalized in contracts or based on customary understandings, entails studying the following:

- Which services are being provided, by whom and to whom;
- What is being exchanged in return for each service;
- Which governance mechanisms structure the service delivery and whether this results in the provision of services in a way that suits those concerned.

Our concern here is not with the service arrangements between farmers in the case of self-provision of services, which is the most common form in much of the developing world, or with the arrangements between farmers, local irrigation management entities and others governing the provision of primary and secondary irrigation services. While important for a clear understanding of the internal workings of locally managed irrigation and identifying areas for improvement (see Huppert et al., 2001, for different strategies to strengthen locally managed irrigation), we focus here on the external threats to the sustainability of locally managed irrigation. Several essential support needs for locally managed irrigation in water-scarce basins stand out, namely water rights systems and water allocation mechanisms, compensation mechanisms for water transfers, and increasing water productivity. These three support needs are briefly outlined below.
13.3.1 Water rights systems and water allocation mechanisms

The basins studied in this book demonstrate the increasing pressure being placed on irrigated agriculture to relinquish water, primarily for environmental and urban/industrial uses. It follows that in water-scarce basins with increasing competition for water, the need for effective mechanisms for allocating water becomes critical. In the absence of such mechanisms higher-value uses will tend to out-compete lower-value uses (with value being defined politically as well as economically), depriving them of water and leading to unregulated transfers of water out of agriculture. A crucial support need of locally managed irrigation is basin-level water allocation mechanisms for both primary and derivative water, which are based on defined water rights that provide security of tenure. The call for clear, secure and transferable water rights has often been made, but how to create property rights to water that are just, equitable and feasible (both technically and politically) and how to make them stick is neither clear nor straightforward. Nonetheless, several principles can be defined.

Water rights form part of property regimes, which define ownership and consist of principles and rules to resolve disputes over property. They may be defined as ‘authorized demands to use (part of) a flow of water, including certain privileges, restrictions, obligations and sanctions’ (Beccar et al., 2002, p. 3). Ideally, water rights delimit the amount of water a right-holder is entitled to, defined either volumetrically or in terms of shares of available supply, as well as the duties of right-holders relative to one another and to society at large, such as quality and quantity of return flows. Water rights form the foundation of water allocation mechanisms. An ideal water allocation system is characterized by flexibility in the allocation of water supplies, security of tenure for established water users, predictability of the outcome of the allocation process, equity and fairness. Mechanisms to allocate water may take a variety of institutional forms, and include marginal cost pricing, public (administrative) allocation, water markets and user-based allocation (Dinar et al., 1997). The prevailing system of water rights significantly influences the specific allocation mechanisms available and the effectiveness of their application. However, without infrastructure in place to withdraw and distribute water, water rights remain an empty shell. Conversely the creation of hydraulic property can lead to the de facto creation of water rights (cf. Coward, 1986; Chapter 11).

Due to the type of infrastructure involved and the feasibility of transparent and reliable measurements, surface water may be subject to more effective allocation than groundwater. Almost everywhere in the developing world, groundwater is treated as an apertinent right to privately owned land, and where groundwater rights significantly different from these have been tried – as in Mexico – they have defied enforcement. For surface water, three broad water rights systems have developed historically in different parts of the world based on either the riparian or the appropriation doctrines (Simpson and Ringskog, 1997). All three are ‘administered’ systems in the sense that an authority (government or community) plays an important role in defining, allocating and enforcing rights. Other property regimes for water are also conceivable, such as a market-based system in which water rights are awarded to the highest bidder, but are much less common in practice.

Under the riparian doctrine, a user has the right to extract water from a river system for use on land adjacent to the river as long as the water is returned to the river undiminished in quantity or quality and in a manner that does not impair downstream use. From this stringent definition, it is clear that in practice the pure riparian doctrine does not exist, and that it is also not very suited to conditions of water scarcity. Nonetheless, this doctrine is used in various forms throughout the world, especially in countries with humid climates, and generally
operates without any form of permit or regulatory administration.

Under the appropriation doctrine, water is regarded as a good belonging to all and held in trust by the State or a communal authority. Water use concessions or licences are issued to users by the state or the communal authority, which ensures their right to divert or store and use a certain quantity of water. Many variations on the appropriation doctrine exist, the most common two being prior appropriation and proportional appropriation. The most significant difference between these two is how they treat water shortages. Under prior appropriation, the first rights issued on a river have priority or seniority implying that rights issued later are the first to be curtailed in times of shortage (last in, first out). Under the proportional appropriation system, concessions (usually time bound) are issued to either individual users or organizations for the use of a maximum quantity of water, although the actual quantity of water that may be used in any year is adjusted to reflect water availability within the river basin. Thus, all concession holders share in any shortages or surpluses of water proportionally. For this to work well, an administrative water allocation mechanism needs to be in place that can determine annual water availability in a timely and transparent manner. Surface water rights in the basins studied in this book are based on some variation of the proportional appropriation doctrine, with the exception of California, which has a mix of riparian rights and prior appropriation.

The closure of river basins calls for a reassessment of the usefulness of the appropriation doctrine, be it prior or proportional. The prior appropriation system, while providing security of tenure, is problematic in water-scarce basins as it does not provide for sharing shortages among right-holders, nor does it allow for new entrants (Huffaker et al., 2000). Furthermore, due to the seniority principle, the actual transfer of water rights is problematic, as all appropriators more senior than the buyer will need to approve the sale, while selling water may also be interpreted as proof of non-beneficial use, constituting grounds for revocation of the water right (cf. Rosegrant andBinswanger, 1994; Bolding et al., 1999; Haddad, 2000). The flexibility of the proportional appropriation system would appear to permit the application of various allocation mechanisms, including market-based ones. However, regulating large numbers of small users is exceptionally difficult and places strong demands on enforcement.

In the basins studied in this book – and others in the developing world – existing water rights systems and allocation mechanisms are not well tailored to deal with basin closure. This is clearly the case in Turkey and Mexico, whose water rights systems are generally unable to prevent or to resolve conflicts between new and existing claims, or prevent the over-allocation of water. This is even more so in stressed basins in poorer countries in South Asia and Africa. In addition, most water rights systems primarily deal with surface water, with much less attention given to groundwater or derivative water. Thus, in the case of California, groundwater is only lightly regulated and the permissive specification of rights to groundwater has led to increasing problems with aquifer overdraft. In the Gediz basin, shallow groundwater is an open-access resource, meaning that anyone with the infrastructure to tap that water can do so. In the Lerma–Chapala basin, groundwater is in effect also an open-access resource, although formally groundwater users are required to obtain a pumping permit from federal authorities indicating a maximum extraction rate. This is by far the best that any middle- or low-income country with a substantial irrigated agriculture sector has done to bring a modicum of order in private appropriation of groundwater for irrigation. The reform has helped register all groundwater users; but restricting their withdrawals to their permitted quotas has proven to be nearly impossible.

In closing river basins with significant groundwater extractions, surface irrigation systems, both large and small, play an increasingly important – often the sole – role as cheap and effective groundwater recharge systems. In effect, groundwater users pump water previously paid for by farmers...
irrigating with surface water, without compensating these surface irrigators. As long as this is conjunctive use by the same farmer this is not a problem, but in areas where groundwater levels have fallen sharply and only the better off can afford to continue pumping groundwater, this does become an issue for poorer farmers only using surface water. Both in Gediz and Lerma–Chapala, there are strong hydrologic linkages between surface water flows, surface irrigation and groundwater recharge. For Lerma–Chapala, Scott and Garcés-Restrepo (2001) found that approximately 50% of canal water applied to crops recharges the underlying aquifers and subsequently becomes available for pumping. Because of this recycling, half of each unit of canal water provides subsequent additional benefit as groundwater. By way of example, assuming marginal values of Mex$1.80/m³ for canal water and Mex$2.40/m³ for groundwater, with 50% recharge the aggregate value of surface water is Mex$3.00/m³. However, groundwater users do not pay canal water users for the recharge function they perform, while canal water users do have to pay for the full volume of water they receive, including the 50% that goes to deep percolation.

The situation surrounding derivative waters (agricultural return flows and municipal/industrial wastewater) is even less regulated. In all the basins studied, quality standards exist for return flows and wastewater, but access to this water for productive purposes would appear to be a free-for-all, with the exception of California. In the delta of the Gediz basin and in the Lerma–Chapala basin, derivative water is becoming a critical source of water for farmers. Although no allocation mechanisms exist for derivative water, in Mexico, farmers do need to go through a fair amount of trouble to establish a tenuous claim on wastewater by reaching local agreements with municipalities or WUAs (Buechler and Scott, 2000). These claims are being threatened by the construction of wastewater treatment plants and the de facto reallocation of treated water to other uses, such as golf courses. In closing river basins, where the better off have already captured primary water sources and renegotiating water rights is extremely complicated, derivative water rapidly becomes the poor farmer’s last resort and should be recognized as such.

Without secure water rights and clearly defined water allocation mechanisms, individual farmers and locally managed irrigation systems in water-scarce basins face an uncertain future. The hydrological interactions between surface water, groundwater and derivative water make it necessary to arrive at a coherent and feasible system of water rights and water allocation mechanisms in water-scarce basins. Several issues that such a coherent system of water rights would need to deal with stand out, namely surface–groundwater interactions, return flows, water quantity and quality interactions, provisions for basic human needs and environmental flows, and lastly provisions for new entrants. The new water rights system and water allocation mechanisms in South Africa appear to meet all these needs, and could serve as an example for the other countries studied in this book if they can be implemented successfully. The establishment, modification or clarification of water rights systems requires action at the national level (legislative and executive branches of government), but ideally should consist of a process in which all interests have adequate representation. The support services required by local irrigation management entities in this regard are legal advice and representation as well as lobbying capabilities at the basin and national level.

13.3.2 Water transfers and compensation mechanisms

A second critical support need of locally managed irrigation in water-scarce basins is compensation mechanisms for water transferred out of agriculture. This is closely tied to water rights and water allocation mechanisms, but is sufficiently important to warrant separate consideration. In recent years, there has been an increase in interest in the feasibility of establishing water markets (Rosegrant andBinswanger, 1994;
Lee and Jouravlev, 1998; Haddad, 2000). In principle, water markets enable allocation of water to high-value uses and fair compensation of those who sell their water. Especially in the case of inter-sectoral water markets, e.g. between the urban and agricultural sectors, several advantages are apparent, including more efficient use of water in agriculture and compensation to farmers for the transfer of water out of agriculture. Rosegrant andBinswanger (1994) outline the following benefits of well-designed water markets:

- Empowerment of water users by requiring their consent to water reallocation and compensation;
- Incentive for users to invest in water-saving technology, if well-defined rights are established;
- Incentive for efficient use and income through sale by considering full opportunity costs of water;
- Greater flexibility in responding to changes in the production environment (crop prices, demand patterns and comparative advantage).

While the economic virtues of efficiency and productivity are invoked as beneficial outcomes of water markets, the very real obstacles to establishing inter-sectoral water markets are often overlooked (Haddad, 2000; Young, 1986). Chief among these are issues of access to water and the lack of infrastructure to enable physical exchange and effective measurement of water (Dinar et al., 1997; Perry et al., 1997; Simpson and Ringskog, 1997). Market transactions assume that effective means exist for the exchange of commodities. Groundwater may be transferred from existing low-value uses to competing high-value uses only within an aquifer, not within a larger river basin unless considerable investment is made in infrastructure for water conveyance. The same is true for surface water, although the presence of rivers makes transfers from upstream to downstream uses feasible. Transferring water in the opposite direction requires substantial investments in infrastructure and control mechanisms.

Much of the claims for the ‘success’ of surface water markets, especially outside of the USA, rest more on political and ideological beliefs than on rigorous empirical studies (Kloezen, 1999). In the case of Chile, Bauer (1997) convincingly demonstrates that water markets are much thinner on the ground and hence less effective in water allocation than often assumed in policy papers. For groundwater, the situation is different, with active markets reported on in South Asia (cf. Shah, 1993; van Koppen, 1998). While groundwater markets have also had positive impacts on the poor (Shah, 1993), there is widespread concern that surface water markets will result in the concentration of water rights in the hands of the few, at the expense of small farmers (Bauer, 1997; Zwarteveen, 1997). The challenge this poses is to design regulated water markets that are pro-poor, recognize the social and environmental values of water, and facilitate the resolution of inter-sectoral conflicts through compensation.

If appropriately designed, water markets may provide a good mechanism to compensate farmers for water transferred out of agriculture. Pre-conditions for the effective operation of water markets include defined water rights, demand in excess of supply, legal frameworks that indicate how trades should take place, physical infrastructure for conveyance and measurement of water, and provisions for the protection of third-party interests (Perry et al., 1997; Simpson and Ringskog, 1997; Lee and Jouravlev, 1998). In combination with the proportional appropriation of water rights and administrative allocation, socially just water markets are conceivable. Such a system could consist of three tiers, namely a reserve for basic human needs and the environment, a reserve for productive water for the poor and a third tier consisting of water for productive use and additional water for urban use and the environment. Only the third tier would enter the water market, after proportional administrative allocation on an annual basis has determined the water available for productive use. Special provisions would need to be made to enable the poor to lease their productive water if they so decide, while
protecting their ownership of the water right. This system demands a strong regulatory and administrative framework, but is theoretically conceivable in Turkey, Mexico and South Africa, although water laws in all three countries are notably vague on the possibility of such market-based transfers.

Water rights transfers in the third tier can take a variety of forms, depending on factors such as the structure of the market, legal and third-party considerations, the characteristics of the water rights, transaction costs and above all, the needs of the parties to the transaction. Three types of transactions can be identified, namely sales, lease contracts and option contracts (Lee and Jouravlev, 1998). Sales consist of the permanent transfer of title, including all benefits, costs, risks and obligations associated with the water right. Sales are most typical of inter-sectoral transfers, with irrigated agriculture being the dominant water seller and urban users the principal buyers. The leasing of water rights involves the sale of water, but not of the water right. Leases tend to be short term, consisting of the temporary exchange of a quantity of water for monetary or other remuneration, and are frequently used for water transfers within irrigation systems.

Option contracts are long-term agreements to lease, but not to sell, a water right when a given contingency arises, e.g. a drought. Under option contracts, the receiving party holds an option to buy water at a specified price under specified conditions from the seller, who guarantees future delivery if the conditions apply. In exchange for this guarantee, the holder of the option also pays a premium to the granting party, usually at the onset of the option contract. Option contracts are most commonly used to transfer water from irrigated agriculture to non-agricultural uses such as the environment during periods of low stream flow (Landry, 1998). This means that water users can continue to use their water during years of normal water availability, and hence option contracts are a more attractive alternative than the outright sale of water rights or long-term leases. Although option contracts are quite complex and require clearly established water rights, initial experiences with them in Chile (Thobani, 1997) and Colorado (Michelsen and Young, 1993) have been quite positive. In our assessment, an option contract arrangement may be suitable to compensate farmers for agriculture-to-urban and agriculture-to-environment water transfers. Crucial to the design of appropriate option contracts are:

- Definition of the contingency conditions under which water will be transferred;
- Duration of the contract and/or conditions for its renegotiation prior to expiration;
- Volumes to be ceded (by whom in the case of multiple parties or states);
- Specification of compensation (both monetary amount and process) for lost income resulting from the water transfer;
- Mechanisms to redress grievances on the part of ceding, receiving or third parties.

### 13.3.3 Increasing water productivity

The third critical support need for locally managed irrigation is assistance in increasing the productivity of water. While the view that irrigation uses water inefficiently may often be erroneous, to be credible partners in basin management local irrigation management organizations and farmers will need to show that they are using water productively. This can be measured in terms of the biomass or income produced per cubic metre of evapotranspiration. Both elements of water productivity are important but place different demands on the support needs for locally managed irrigation. Higher biomass production can be

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1 Not per cubic metre withdrawn, as irrigation water that is not used in the production of biomass will either recharge the aquifer or become available for re-use as return flows (see Kijne et al., 2003).
achieved through improvements in water delivery practices, crop varietal improvement and improved cultural practices (such as mulching, crop planting dates, etc). The breeding of new crop varieties, the introduction of improved cultural practices and similar actions require agricultural support services, whereas improving water delivery is the primary responsibility of the locally managed irrigation entity. However, external support remains important to improve irrigation infrastructure and management to enhance reliable water delivery and to realize real water savings.

Improving the productivity of water in economic terms is crucial for sustainable locally managed irrigation. Perhaps one of the biggest threats to locally managed irrigation is the low profitability of agriculture and the high costs of agricultural production. Solving problems related to the levels and collection of irrigation service fees as well as the quality of irrigation service delivery is an internal responsibility of locally managed irrigation entities, but the willingness and ability of farmers to pay fees is clearly related to crop market prices and economic returns to agricultural production. Where appropriate, shifting to less-water-consuming crops that provide a higher economic return needs to be supported. The efforts to do so in the Lerma–Chapala Basin, with farmers and government agencies working together to shift from low-value grain crops to crops that use less water and sell at a higher price, show how complicated it is to achieve this for substantial areas. Although increasing the profitability of agriculture touches on much wider issues than support needs for locally managed irrigation, such as trade regimes and agricultural subsidies in affluent countries, it lies at the heart of sustainable locally managed irrigation.

13.4 Poverty and Representation in River Basin Management

The case studies in this book show that ensuring the sustainability of locally managed irrigation and meeting the water needs of the poor in closing river basins is a serious challenge to current institutional arrangements. Although a service provision perspective on water management highlights where changes are necessary in the wider institutional environment to more effectively support locally managed irrigation, it is relatively silent on two critical issues in closing river basins in low- and middle-income countries, namely poverty reduction and stakeholder representation. Cross-cutting these two issues is the question of how access to water and water management decision making is gendered. A sustainable livelihoods perspective, with its emphasis on rights and entitlements and the institutional arrangements through which these are provided and reproduced, holds more promise for defining pro-poor water policies in water-scarce basins (cf. van Koppen, 2000).

13.4.1 Productive water and pro-poor water policy

Although river basin closure poses significant challenges to the sustainability of locally managed irrigation, generally this affects people who already have access to water for productive purposes. A characteristic of many stressed river basins in developing countries is the large number of poor people who do not have access to water for productive purposes. The degree of water deprivation in many river basins around the world is well documented, with more than 1 billion people lacking access to water of sufficient quality and quantity to meet minimum standards of living, let alone for productive purposes. The processes that come into play as river basins mature can have serious consequences for perpetuating poverty.

In analogy to low prices for basic grains, which hurt poor farmers but benefit the poor urban population, the reallocation of water from agriculture to urban supplies may benefit the urban poor. Whether this is the case depends on how the institutional
and financial resources for urban water infrastructure development are targeted at the poor. As many maturing river basins exhibit a rapid pace of urbanization caused by rural poor moving to the cities, on balance the transfer of water out of agriculture could benefit more poor people than are hurt. Likewise, as agriculture matures and consolidates, taking water out of agriculture may be hurting the better off rather than the poorest. If farmers invest to improve the productivity – and profitability – of water there may not be any major damage to their livelihoods. Understanding how these scenarios work out requires empirical research.

However, other processes act in the opposite direction. These relate to the development of the physical means to abstract and convey water and the distribution of land and water rights. If water infrastructure development and the allocation of land and water rights is not specifically targeted at poor women and men, the danger of resource capture by the better off is ever present. While freshwater supplies are clearly limited, for most people water scarcity is caused by political, technological and economic barriers that limit their access to water and by competition between water users (Falkenmark and Lundqvist, 1998). Water scarcity is not only a naturally occurring phenomena, but has also been created through the development of water resources in the past, the selective entitlement of water rights and incidental and structural resource capture by the better off (cf. Homer-Dixon, 1999; GWP, 2000). These processes make it very difficult to increase and protect the water security of the poor, especially in closing river basins where the consumption of water by one literally deprives another of that water.

While the processes that come into play as river basins close have multiple and uncertain consequences for perpetuating poverty, it is increasingly recognized that access to water for productive uses is very important for the poor to build sustainable livelihoods (van Koppen, 2000; Schreiner and van Koppen, 2001). We maintain that pro-poor water allocation policies can transform irrigation into a powerful instrument for creating sustainable livelihoods (cf. Hussain and Hanjra, 2004; Shah, 2000). The challenge this poses in water-scarce basins is balancing the allocation of productive water for poverty reduction with allocations designed to meet the needs of proven productive capacity (i.e. industry, commercial agriculture, mining) and the environment (cf. Perret, 2002). This may make it necessary to redistribute water rights in favour of the poor, but also calls for a judicious use of water and innovations in land and water management technologies.

To craft pro-poor water policies, an understanding of the processes that create poverty is needed. While individuals experience poverty and can work their way out of poverty, there is also truth in the statement that societies produce poverty through processes of exclusion. Culturally embedded notions of entitlements, ownership, access, control and participation underlie the concept of exclusion (Bhalla and Lapeyre, 1997, p. 417). The deprivation commonly associated with exclusion is not only related to a lack of economic resources but also a lack of recognition and entitlements. As pointed out by Sen, ‘economic resources enable access not only to economic goods and services but also to political goods like freedom and the ability to influence policies’ (1975; cited in Bhalla and Lapeyre, 1997, p. 418).

In this sense, access to water can be viewed as a potential vehicle to achieve economic and political rights. These are prerequisites for full citizenship, which in turn open opportunities for political participation. This interpretation brings out the state’s role in exclusion. Through their structures, procedures and legal frameworks, governments can exclude some groups from fully attaining their economic rights, while including others. A case in point is the systematic exclusion of women in government irrigation programmes throughout the world, convincingly documented in numerous case studies (for a discussion of the literature, see Zwarteveen, 1994, and van Koppen, 1998).
A defining feature of poverty is that the poor have very little influence on the ways in which governments and economies allocate rights and resources in society. In closing river basins, pro-poor water policies that focus on redressing imbalances through the reallocation of water rights will challenge the existing distribution of rights and resources as there is no extra water to go around. This creates the political dilemma of confronting vested interests in society, and requires that government has both the organizational and political ability to overcome resistance to redistribution. An important first step is the formulation of water legislation that sets out procedures for the creation of a reserve of productive water for the poor and how new institutions such as river basin management entities can work in a redistributive manner (cf. van Koppen, 2000).

Of the five basins reviewed in this book, South Africa is the only country formally placing emphasis on redressing imbalances and achieving equity in water management. In the Government of South Africa’s White Paper on national water policy (DWAF, 1997), three components of equity are defined: equity in access to water services (drinking water and sanitation), equity in access to water resources (water for productive purposes) and equity in the access to benefits from the use of water resources (allocative efficiency). However, even with the commitment of the government, reallocating water to new entrants is proving very difficult (van Koppen et al., 2003). A way forward could be to impose water savings on commercial agriculture and other productive uses, and then allocating these savings to a water reserve for the poor. Under the system of compulsory water licensing included in the 1998 National Water Act, this is possible, but it will require determined resolve from the government to carry it through (cf. Perret, 2002). Compulsory water licensing is currently being piloted in one river basin, making it premature to draw conclusions. New infrastructure will also need to be developed, to ensure that the water rights of the poor do not remain paper rights.

13.4.2 Representation in river basin management

An important challenge in river basin management is ensuring that all stakeholders have a voice in basin governance. Although frequently advocated as a key to achieving effective water management, stakeholder participation in river basin management is not straightforward, and actually including the poor and achieving substantive stakeholder representation has proven elusive in practice (Wester et al., 2003). The question of how greater equity in water management and representation in river basin management can be achieved in highly stratified societies with significant gender and social inequalities remains. As poverty is an outcome of how societies are structured, it is evident that marginal groups are excluded from decision making. A danger of the emphasis on participation in river basin management is that attention is drawn away from the very real social and economic differences between people and the need for the redistribution of resources, entitlements and opportunities. In the long term, marginal groups will only gain a voice in river basin management when they are no longer marginal. This entails fundamental changes in the way societies are structured, such that they no longer produce poverty but wealth that is fairly distributed. As it is unlikely that this will happen in the near future, in the short run mechanisms need to be devised that strengthen the representation of marginal groups in river basin management.

It is clear that the size of the population in most river basins is such that it precludes the direct participation of all stakeholders in basin-level decision making. Thus, as decision making moves to the river basin level, serious thought needs to be given to how hard-won democratic rights in conventional social and political domains are assured in the river basin domain (cf. Barham, 2001). As Green and Warner (2000) point out, integrated water management and participation pull in opposite directions. While the complexity of integrated management of sizeable river basins invites centralization
and technocracy, participation suggests subsidiarity and small-scale operations, engaging people to think creatively about issues with which their lives are intimately linked. Thus, in any basin of some size, river basin management would entail a layered system of representation. The question then becomes who gets to represent groups of stakeholders in river basin management. This question strikes at the heart of basin governance, and revolves around which type of democracy is implied, liberal or social.

Liberal democratic theory is premised on a notion of abstract individualism and assumes that all people are equal in the public sphere (Held, 1995; Luckham et al., 2000). In water reforms informed by liberal democracy, it is assumed that it is possible for water management stakeholders to bracket status differentials and power inequalities and to deliberate ‘as if’ they were equals in water management forums such as WUAs or river basin councils. Social democracy, on the other hand, departs from social inequalities and attempts to increase citizen involvement in the affairs of government and expand the concept of citizenship to cover economic and social rights as well as political rights. Thus, it aims at a redistribution of power and resources to enable citizens to participate in the decisions that affect their lives (Luckham et al., 2000). In water reforms informed by social democracy, water is seen as a basic human right and a politically contested resource (Gleick, 1998; Mehta, 2000).

On the face of it, stakeholder platforms, be they river basin councils, catchment management agencies or watershed councils, democratize river basin management by giving voice to a multiplicity of interested actors. However, much depends on the existing institutional arrangements from which stakeholder platforms for river basin management emerge, as many roles, rights and certainly the technologies and physical infrastructure for controlling water are already in place. In river basins, water management stakeholders may have different levels and kinds of education, speak different languages, differ in access to politics and hold different beliefs about how nature and society function (cf. Edmunds and Wollenberg, 2001). If this is not taken into account when creating new rules, roles and rights, the institutional outcome can easily privilege those who are literate and have access to the legal system. If done unreflectively and without an emphasis on the redistribution of power and resources, new institutional arrangements for river basin management will institutionalize inequality and power differentials instead of giving voice to marginal groups (Wester and Warner, 2002). Without firm land and water rights and livelihood security, there is very little incentive for the poor to participate in river basin management.

Having argued for social democracy in river basin management, the issue of stakeholder representation remains. The relationship of the representatives participating in river basin management to their constituents is problematic, especially when third parties are involved. It is a nostrum of development work that third-party facilitators are needed to help identify, mobilize, organize and inform stakeholder groups. However, as pointed out by Edmunds and Wollenberg, the relationship of a representative to his/her constituency is perhaps most politically charged when representatives of a group are designated by outsiders or are accountable to them, as is often the case in multi-stakeholder negotiations. From the start, outside conveners and facilitators influence representation by the selection of stakeholder groups, the people to represent each group and how the expression of interests is facilitated in the meeting. (2001, p. 240)

This points to the need for a broad and inclusive process of invitation, consultation and consolidation of interested stakeholders, assumed to represent all interested parties. Whereas stakeholder processes and representation in river basin management are important, they need to be twinned with a focus on securing water entitlements for the poor. This points to an important role for government, both in drawing up and enforcing water laws that explicitly safeguard customary water rights and contain provisions for reallocating water rights to the poor.
13.5 Conclusion

Reflecting on the challenges facing smallholder irrigation in water-scarce basins, it becomes clear that where poverty is widespread, river basin management needs to have a strong developmental dimension. However, where the extra water for productive purposes that is needed for poverty alleviation will come from is less clear. If a country is rapidly industrializing and diversifying its economy, perhaps this is not an issue. However, most poor countries are not creating alternative employment at a sufficient rate to provide the rural poor with attractive alternatives to agriculture. In such cases trying to intensify smallholder agriculture, which often requires irrigation, is the only feasible strategy in the short to medium term. Thus, central concerns become the mechanisms in place to allocate water rights, the regulatory entity responsible for water allocation, and how conflicts about water rights and water distribution are mediated. Finding the right mix between the state, the market and the empowerment of the marginal points to the need to move beyond token consultation towards partnerships, negotiations and conflict resolution. At the minimum, strategies for river basin management should detail mechanisms for redressing imbalances in access to water for productive purposes and establishing clear and secure water rights for the poor.

While much can be learned from institutional arrangements for river basin management in affluent countries, it is crucial to understand that these do not operate in the conditions of low-income countries: dominance of smallholder agriculture, weak institutions, insufficient financial and human resources, marked social inequity and extreme poverty. While water development and management can only partly address these issues, they must explicitly form the points of departure in the reform of institutional arrangements for river basin management in developing countries. This chapter does not hold the answers to how this should be done, but it does offer elements of a strategy that could be followed to address water deprivation in closing river basins in developing countries. Such a strategy consists of a fine balancing act between allocating water for poverty reduction and allocations designed to meet the needs of proven productive capacity.

References


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