

# Managing Water Resources: Communities & Markets

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In the world:

- 120 crore people throughout the world do not have access to safe drinking water.
- 240 crore people (one-third of the global population) do not have access to sanitation.
- More than 22 lakh people die each year due to water borne diseases.
- 6000 children die every day from diseases that can be prevented by improved water and sanitation facilities.

In India:

- 12 crore people do not have access to safe drinking water.
- 21% of all communicable diseases are water related.
- 15 lakh children under the age of 5 die annually due to water borne diseases.
- 81.4% of the urban households and 55% of rural households have access to safe drinking water.

However, India is one of the wettest countries of the world with 1700 mm annual rainfall; USA has only 200 mm. The total water requirement for the country is 450 BCM while we receive an annual precipitation of 4000 BCM. Why doesn't then India have enough water for all?

According to L C Jain, former member of the Planning Commission, India has over the last 50 years spent \$ 50 billion on developing water resources and another \$ 7.5 billion on drinking water with little to show for the money—much of which was siphoned out through a corrupt contractor system (Devraj 2002). Apart from big dams and irrigation systems, the government has encouraged the digging of millions of tubewells and borewells energised by electric and diesel-driven pumps that now provide half of the country's irrigation. Mr Jain suggests that the only remedy available now is for India's Ministry of Water Resources to be wound up altogether and then empower the local bodies.

### **Water Scarcity: The Tragedy of the Commons**

What is common to many is taken least care of, for all men have greater regard for what is their own than what they possess in common with others.

Aristotle

The famous biologist Garret Hardin maintains that environmental problems are the result of the tragedy of the commons. Underlying any environmental problem is a resource that is commonly or collectively or publicly owned. A common resource with an unrestricted access gives rise to these problems: depleting fish populations, overuse of water, clear-cutting of forests, poaching of animals. What is the resource that is commonly owned in each of these environmental problems? Fish, water, forests, and wild animals. Among all resources, water is the most open-access commons.

Historically, access to a common resource—village pastures for cattle grazing, forests for fruits and fuelwood, wild animals for hunting, river water for agricultural use—was controlled by norms and customs, either articulate or inarticulate. Ever increasing demand for these resources due to growing population, accelerating economic development, and improving technologies began to put pressure on the informal norms and customs that controlled use of these resources. Unfortunately instead of building on the informal arrangements that had worked well, a completely new method was adopted. The state took over the ownership and management of common resources. The process of state control began under the British but

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still continues unabated after Independence.

The basic solution is to put these resources back in the hands of the people—convert the informal arrangements that had worked before into formal and legally enforceable rules and contracts.

Transfer management and ownership of the commons to local communities and user groups. Simultaneously, the state must withdraw from day-to-day management and focus on the overall policy and legal framework within which people will own and manage their common resources.

The principles recommended here are old wisdom: user rights, and user ownership and responsibility for managing collective services and common resources. This wisdom somehow died in the middle—historians would debate the reasons—but now is the right time to recognise it. The modern disciplines of new public management, public choice, and new institutional economics provide further support to the old wisdom. New technologies have made it possible for people to acquire necessary information and take prudent decisions. All the ingredients for sustained development and wise use of natural resources are present, we need only the courage and foresight to bring them together.

The single change of legal ownership and genuine participation of people addresses many of anomalies of the current state controlled management. Ownership brings responsibility: state subsidies, which largely went to the richer groups, will continually decline, as people will take charge of service provision; full cost recovery will reduce overuse and misuse; rights-based allocation decisions will become more immune from political calculus.

The government of India's recent policy, National Water Policy 2002, acknowledges the changed realities and emphasises a new institutional set-up for managing water resources. The basic principles of this policy are: 1) water should be treated as an economic good instead of a free service; 2) the approach should be demand driven and not supply driven, 3) the government should function as a facilitator and not service provider, and 4) users should be fully responsible for operation and maintenance of the services. These policy directives are a right step, but only the first step.

### **Community Water Rights: Fair and Sustainable Solution**

Just as man can't exist without his body, so no rights can exist without the right to translate one's rights into reality—to think, to work and to keep the results—which means right of property. The modern mystics of muscle offer you the fraudulent alternative of "human rights" versus "property rights," as if one could exist without the other. The doctrine that "human rights" are superior to "property rights" simply means that some human beings have the right to make property out of others...

*Ayn Rand, Atlas Shrugged*

Many countries now have elaborate systems of clearly articulated and centrally administered water rights for all diversions from surface waters based either on the historical use or limited duration licensing arrangements. Eventually we shall also need to create such systems for water rights on all surface and groundwater resources of the state. But this in itself is a huge undertaking requiring detailed studies and planning for creating appropriate laws and institutions for creating and administering the water rights system and would require years. A beginning can be made by first establishing rights on project waters.

### Riparian Rights

Because of its transitory nature, the rules governing its use have evolved in different ways than those governing other resources. The British common law jurist, William Blackstone, asserted that "*water is a moving, wandering thing, and must of necessity continue common by the law of nature; so that I can only have a temporary, transient, usufructuary property therein*" (quoted in Webb, 1931). The riparian doctrine that evolved under English common law gave all landowners and other residents living on the banks of a natural stream or river a right to an undiminished quantity and quality of water. This right is restricted to riparian owners, that is, to those whose lands border a stream or river and is firmly attached with these lands. Non-riparian owners cannot possess this right. Moreover the right is correlative—it must be shared coequally with the other riparian owners. The doctrine prohibits alteration of the stream. Instead it requires that a stream be allowed to flow in its natural watercourse as it was accustomed to flow undiminished, unobstructed and unchanged in quality. The right is for the use of water and there is no ownership in the corpus of the water.

It is clear that the riparian doctrine works well in humid areas where the rainfall is abundant and consumption is confined mainly to domestic and livestock use and diversion of water for irrigation is unnecessary. Under these conditions riparian owners can exercise their usufructuary rights without harming downstream owners.

This doctrine of riparian rights is still prevalent in many parts of the world including the eastern states of USA. In India too it exists in law. But in practice it is often not followed and what we find is a mixture of state monopoly and "free for all" situation.

### Prior Appropriation Rights

The riparian rights doctrine seems to be ill suited to arid areas where rainfall is less than twenty inches. Here the use requires diversion of water in quantities greater than necessary for domestic and livestock consumption and this would impair the downstream riparians. Moreover, the availability of water varies from season to season and year to year. This would mean that not everyone's demands can be satisfied in low water years. Hence an alternative system of water rights evolved in the arid western regions of the United States during second half of nineteenth century.

The first major rush for settlement in west came from the miners who flocked to these areas in great numbers in search of gold. The rules and customs developed by the miners for the mining claims also played a major role in the evolution of this doctrine. Since the miners were in fact squatters on the public domain, they applied the law of the public domain, first in time, first in right. After the days of the pan and shovel gave way to ditches and sluice boxes, questions of right to use the streams arose. And the miners applied the same rules to water as they had to the land. He who diverted water first had the prior right to it to the extent of his diversion for use on both riparian and non-riparian lands. To perfect the right, ditches had to be dug with diligence and water applied to beneficial use. It was not to be wasted. And as with mining claims, the right ceased when the use ceased. Here was the genesis of a new property right in water.

The same rules were later applied to diversion for irrigation as initial farmers were all disappointed miners who had failed to strike gold and decided to settle and start agriculture. These rules represented a marked departure from riparian doctrine in that they: 1) granted to the first appropriator an exclusive right to the water and conditioned other rights upon the prior rights of those who came before, 2) permitted diversion of water to non-riparian lands,

3) limited the amount of water that could be claimed to that which could be put to beneficial use, and 4) allowed for transfer and exchange of rights.

Initially one had to simply take and use water to establish the claim. Later, this was formalised by posting a notice of intent to take water and recording such notice in the county of local jurisdiction. Legislation and court decisions started recognising this method, known as prior appropriation, which eventually was adopted into a formalised framework of a water rights allocation system. The courts have recognised the possessory interest in the water use, although not in the corpus of the water. The different western states each have developed administrative regulations and procedures for appropriating water under which the major use of water occurs. As it involves recording of who diverted water when and how much, this system requires an elaborate and sophisticated system for acquiring, recording and enforcing of rights. All western states have established centralised administrative system with state engineer for the same.

### **Community Management of Water Resources**

In recent years, many countries across the world--Sri Lanka, Nepal, Philippines, Indonesia, Mexico, and Turkey are some of the well-known ones--have initiated programs to transfer some or all responsibilities for management of irrigation and related water services to local organisations of farmers. The scope of the responsibilities transferred, physical conditions of the services, and institutional elements of the transfers vary from country to country. In India, states like Andhra Pradesh, Madhya Pradesh and Maharashtra have adopted legislations to promote Participatory Irrigation Management (PIM) and have piloted transfer programs in selected projects from 1994 onwards. Not sufficient time has passed since implementation of most of these programs and as such it is too early to assess the level of performance in terms of sustainability and financial self-sufficiency.

On the other hand farmer-developed and managed local irrigation and agricultural drainage infrastructure services are in existence for decades, if not centuries in many developed countries. Most of the new projects built by the government in these countries kept these farmer-developed systems intact and transferred the management of newly developed services too to the farmer organisations. In United States, for instance, local Water Service Entities (WSEs) of farmers were formed to finance, construct, and operate systems serving up to 100,000 hectares, independent of the usual government agencies. Local WSEs, without government assistance, built systems serving over 80 % of the lands irrigated in California today--the vast majority completed in the late 1800s. Similarly farmer WSEs financed and built many thousands of small drainage schemes that serve 60 million hectares in the US. Most were built from the mid-1800s to the early part of this century and are still maintained by the WSEs. Most of the projects constructed by the Bureau of Reclamation (USBR), kept the local infrastructure created by the farmers intact and transferred the responsibility of all local operation and maintenance to the local WSEs immediately after completion of the project and restricted itself to providing bulk services. Similarly in Europe in widely separated countries, people living in areas prone to inundation by storm water organised and dealt with flood control in the same manner. These schemes commenced in one AD in the Netherlands and from 1200 onward in the rest of Europe.

The story is not restricted to the developed countries with European traditions. Farmer-owned and managed irrigation systems were in existence for several hundred to two thousand years, in Nepal, Sri Lanka, China, and also in tank irrigation in south India. These examples are not isolated entities. They served over 70% of irrigated land in Nepal, still dominate in Bali, and at pre-independence served most land area in south India and Sri Lanka.

All these schemes across different cultures and nations share and exhibit a consistent and common set of institutional principles basic to sustainable, fair, and affordable services to the beneficiaries. They provide crucial lessons for the evaluation of the ongoing transfer programs. Water rights among farmers in sub-areas receiving water under the schemes and between different schemes on the same stream are established by priority and are honoured by the farmers. Equity ownership of facilities by the farmers is universal. The beneficiaries meet all O&M costs and, through representatives, manage the enterprise. Farmers usually share O&M tasks at the immediate neighbourhood (tertiary or higher) level, but often the entity employs operators who route water and assure distribution in the primary and secondary facilities following the entity's rules. All farmers know the rules and violators are promptly penalised. Operation and maintenance costs are shared in proportion to service. The maintenance objective is, unquestionably, to sustain a reliable system on into the future. Often the entities provide more than one service, combining irrigation with agricultural drainage being common. Government provided little assistance in the past and, only in rare instances provides technical advice now.

These lessons from the well-established and proven principles should form the basis of the ongoing transfer programs. Few of these ongoing programs meet this test of long-term sustainability and financial independence and are doomed to fail if the broader corrective actions are not taken.

#### Chattisgarh's Privatisation: Abomination of community rights

The government of Chattisgarh has leased 23.6 km stretch of the river Sheonath in the Durg region for a period of 22 years on a Build Own Operate Transfer (BOOT) scheme to the private corporation Radius Water limited (RWL), a company floated by the local person Kailash Soni. Sheonath project is meant for supplying water to the industrial Estates of Borai, near Durg City (Samuel & Kunhu 2002)

This is example is inconsistent with the community rights approach. Here the government assumes to own the resource and decides whomever it wants to lease it at whatever terms. According to the approach proposed here, the resource should first go to the communities that have customary rights. They may in turn invite private companies to help them manage the newly owned resources.

#### Some Illustrative Case Studies (These cases are taken from Morris 2002)

Failure of governments to allocate water to the satisfaction of users has led to informal, but often illegal, markets in water transfers in many countries of the world. The Pakistan Water and Power Development Authority found active water trading on 70 % of the watercourses it studied ( Pakistan Water and Development Authority 1990) Although trades were not officially sanctioned, it was found that where water had been traded agricultural incomes had increased by 40 % due to greater control by farmers over their water supply.<sup>1</sup> Similarly in India, over half the area irrigated by tubewells belonged to farmers who bought water.<sup>2</sup> The estimated gains from trading water in the whole of India were \$1.38 billion per year. Yet the only policy statements and governmental actions on water markets in India have been to discourage them because they were illegally using electricity for pumping.<sup>3</sup>

Markets in India and Pakistan, and others like them, helped to resolve short run water shortages. Scarcity drove the institutions to make the most efficient use of the available water.<sup>4</sup> But because informal water markets are not supported by existing laws, contracts are

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<sup>1</sup> Strosser (1997)

<sup>2</sup> Shah (1991)

<sup>3</sup> Saleth (1998)

<sup>4</sup> Anderson (1994)

not enforceable. Agreements are only struck by users (usually farmers) who know and trust each other well. The lack of legal title also limits transactions to spot sales of water for brief periods of time, and never permanently, and so trades do not fully capture the benefits of an organised market in secure tradable rights. Unfortunately in many informal water markets (such as those in India and Pakistan) groundwater is depleted because of concerns that markets may be curtailed at any time. Nevertheless, informal markets can occasionally provide the benefits expected from legal markets, such as maintenance of canal delivery systems, because the canals transport purchased water.<sup>5</sup>

### Chile

Chile has the most developed and one of the oldest regimes of water-use trading in the world.<sup>6</sup> All water rights were expropriated by the Chilean Government in 1966. But Chile's 1981 Water Code re-established tradable water rights where existing water users (farms, industries, municipalities, and power utilities) were granted rights to surface and groundwater.<sup>7</sup> New or unallocated water rights were auctioned. Except for a few restrictions, the allocated rights could be transferred or sold to anyone for any purpose at freely negotiated prices. The agricultural sector accounts for 89 % of the estimated 300,000 owners of water rights.<sup>8</sup> Administration is highly decentralised with the monitoring, distribution, and enforcement of water rights carried out by water user associations at the local level—river basin, underground aquifer (for groundwater), primary canal and secondary or tertiary canal. Except for a few large dams and their associated main canals, all hydraulic infrastructure is owned and operated by water users themselves.

In the arid areas north of Santiago there have been many mutually beneficial sales and leases of water, resulting in a voluntary transfer of water to more productive uses. By contrast, in the higher rainfall area south of Santiago, there have been few trades, since the transaction costs of registering the rights and conveying water is greater than the gains from transferring the water.<sup>9</sup> Chile's transfer of water to more productive uses was carried out voluntarily and without having to raise water charges. In fact, water charges fell following the introduction of tradable water rights. The decrease occurred because the Chilean Government facilitated the transfer to user groups the responsibility for carrying out operations and maintenance activities and for setting water tariffs. User groups were able to conduct these activities at a much lower cost than the government. Despite the lower water charges, the opportunity to sell water reduces waste.<sup>10</sup>

Perhaps the greatest benefit of the trading approach has been that demands for environmentally destructive dam building have been dropped. The city of La Serena in Chile is able to meet its rapidly growing demand for water by purchasing water rights from farmers at a lower cost, rather than contributing to the construction of a dam. Farmers received an acceptable price for the water and were induced to use more efficient irrigation techniques.<sup>11</sup> Similarly, when Chile's main water company, Empresa Municipal de Obreros Sanitarios (EMOS), realised that it could no longer obtain free water rights, it invested in a programme to significantly reduce physical water losses. Remarkably, Chile's sustained annual growth of 6 % in agriculture during the 1980s was managed without public investments in new

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<sup>5</sup> Easter et al. (1998)

<sup>6</sup> Livingston (1995)

<sup>7</sup> Anderson and Snyder (1997:192) quote from the Chilean Constitution which translated states that "the rights to private individuals, or enterprises, over water, recognised or established by law, grant their holders the property over them."

<sup>8</sup> Ríos and Quiroz (1995)

<sup>9</sup> Hearne and Easter (1997)

<sup>10</sup> Rosegrant and Gazmuri (1994)

<sup>11</sup> Hearne and Easter (1997)

hydraulic infrastructure. While this was due in part to heavy investment in water infrastructure in previous decades, the tradable water rights regime enabled new water uses, including the rapid expansion of fruit production.<sup>12</sup>

Chile has also been successful in increasing access of the poor to potable water, as 99 % of urban residents and 94 % of rural residents are supplied typically for 24 hours a day. This contrasts sharply with comparable rates of coverage of 63 % and 27 % in Chile in 1970 and with developing countries elsewhere in the world.<sup>13</sup> While this was due to several factors, such as ensuring that regulated water tariffs reflect the true cost of water, allowing competition among water companies (Santiago alone has seven private companies), and subsidising water consumption for those with low incomes, the ability of water companies to buy water from farmers played a significant role.

Chile still has some problems in water use, particularly with quality. The obligations on holders of non-consumptive rights to release water for public consumption in times of shortage were not clearly defined, so dilution for effluent was occasionally low. This reduced water quality and led to conflict between the recently-privatised hydropower companies and farmers. Some shortcomings in the law have also enabled one hydropower company to obtain huge blocks of non-consumptive rights without charge. Despite these problems, Chile has fewer conflicts and makes better use of its water than its neighbours.<sup>14,15</sup>

### **Mexico**

In the past few years, the Mexican agricultural sector, and the economy as a whole, have become more market-oriented, and policy makers have increased security of water rights. According to the 1992 Water Law, and its 1994 regulations, users may convert their existing precarious water rights into more secure tradable "concessions" with a maturity of between 5 and 50 years (most are about 30 years), to ensure security of tenure.<sup>16</sup> However, the rights are not as secure as in Chile. Under the Mexican Constitution, all water belongs to the nation, and the Water Law also mentions the possibility of forfeiture of water rights for the public interest if water is not being used efficiently, or if it has not been used for three years.

By 1995, 85 % by volume of available water in Mexico had been allocated as water use rights and there was widespread leasing and selling of both surface and groundwater rights.<sup>17</sup> Water trades had been common before 1994, but, as in India and Pakistan, these trades were limited, informal, and illegal. Apparently, the authorities tolerated the trades but did nothing to monitor any externalities from them, so unfortunately, aquifers were drained. The new law recognised and encouraged trade (on either a permanent or temporary basis), which reduced total consumption and alleviated externalities (for example, slowing aquifer depletion).<sup>18</sup> Most of the recent trades involve farmers selling to industries, water companies or more efficient farms, thereby encouraging investment in more productive activities. Water trading has also allowed unprofitable farmers to reduce their farming debts and to work as labourers on more efficient farms or to seek alternative employment. Although it may not be an ideal solution, having a tradable asset in water rights gives an inefficient farmer some flexibility.

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<sup>12</sup> Hearne and Easter (1997)

<sup>13</sup> Rosegrant and Gazmuri (1994)

<sup>14</sup> Hearne and Easter (1997)

<sup>15</sup> Bauer (1997) claims that some of the gains from markets have not been as substantial as originally claimed, and external costs had not been widely acknowledged in early studies. Nevertheless, these claims have been contested, particularly that external costs were relatively slight (Easter et al., 1998)

<sup>16</sup> Hearne (1998)

<sup>17</sup> Holden and Thobani (1996)

<sup>18</sup> Hearne (1998)

## **The Western United States**

Shortage of water in western United States led to a system of property rights to water based on the prior appropriation doctrine;<sup>19</sup> whoever first diverted water and established beneficial use, obtained primary rights. Successive claimants could only obtain rights that were contingent upon those with prior rights having received their allocations. Although water rights regimes vary widely between states, their common characteristic is that water use cannot be changed without authorisation of state water authorities. Obtaining authorisation to change water use is often a lengthy and costly business, requiring consent from the relevant governing body after public hearings. Perhaps the most extreme example of restricting transfer between uses occurs in California. The agricultural sector makes up only 4 % of GDP of the state; yet it receives about 44 % of the water. Environmental use is allotted 44 %, while urban and industrial users receive only 11 %. Agricultural water rights vary widely, from cheap, inherited sources to highly subsidised ones. The anomalies that these restrictions cause are extreme; water is so cheap to some users (as low as \$2.50 per acre-foot) that rice is cultivated in the desert, while some municipalities have built desalinisation plants to supplement their supplies of water at a cost of \$2,000 per acre-foot.<sup>20</sup> Even worse are the perverse incentives in conserving water. Farmers are forced to operate under a "use it or lose it" rule, while in towns, rationing during periods of drought is based on family use during periods of plentiful water, which encourages profligacy.

Reform is often discussed (Anderson and Snyder, 1997; Holden and Thobani, 1996; Kemper, 1997) but assigning to farmers the ability to simply sell their rights would give them millions of dollars in windfall gains on top of the large subsidies that they already receive—a politically unpopular result. On the other hand, farmers fear that their allocation will be reduced over time and with no compensation. Therefore, even in a country with well-developed institutions, there is poor administration of water allocation. The solutions used often defy logic and waste resources, and reform is slow.

A notable contrast to the various restricted water right regimes which exist in the western United States is provided by the Big Thompson water-trading scheme of 310,000 acre-feet of water in Colorado.<sup>21</sup> This scheme, which brings headwaters from the Colorado River through a tunnel in the Rocky Mountains to north-eastern Colorado, was partially funded by subscribers in return for use rights. Soon after the scheme was fully operational it became apparent that water demand varied significantly between users and areas within the district. The Northern Colorado Water Conservancy therefore established a system that allowed permanent water right trades. Trades had to demonstrate "beneficial use" and no sales were allowed to areas outside the District. A central registry records ownership and transfers. The system has become so refined that a simple postcard is used to notify the Conservancy of a transfer.

An extremely sophisticated market has evolved for this water and many types of contracts are used, from straight transfers to the purchase and sale of options to water. Within the Conservancy District all the complex infrastructure is in private hands. The Conservancy's role is to record transactions and to check that there is no cheating. The system appears to be operating efficiently within the water District, with supplies going to their highest valued use, although there is undoubtedly an opportunity cost to owners of water rights in not being able to sell their water outside the District.

## **Australia**

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<sup>19</sup> Anderson and Snyder (1997)

<sup>20</sup> Holden and Thobani (1996)

<sup>21</sup> Kemper and Simpson (1995)

Sturgess and Wright studied water transfers along the Murray-Darling River Basin, which stretches 2,530 km from the Snowy Mountains of eastern Australia to its mouth in South Australia.<sup>22</sup> In the worst drought years of 1987/8 there were 687 transfers, totalling 340 million cubic metres, with gains estimated at \$17 million. In better years, a great deal of trading still took place but the total gains were lower: in 1988/9, the corresponding figures were 280 transfers, 85 million cubic metres and \$5.6 million; in 1990/91 the figures were 435 transfers, 120 million cubic metres and \$10 million. The researchers concluded that "if benefits of this scale can be obtained by a system of water transfers circumscribed by regional barriers, the benefits that would flow from redefinition of water property rights to allow the free transfer of water between regions....would be greater still."<sup>23</sup>

### Spain

Maass and Anderson examined the centuries old water market of the farmers of Alicante in Spain.<sup>24</sup> The irregularity of water supply in the region led the Alicante farmers to build the Tibi Dam in the late sixteenth century, which became one of the most admired hydraulic works in Europe. A flexible system of allocation developed to improve water use. Over the years, flexibility was achieved when the use of water was split from ownership of land and permanent and temporary transfers of water became legal. Although the water rights were based on allotted irrigation time from a canal, the rights were translated into volumetric units. By the 1970s the market was sophisticated enough to have temporary transfers, measured in minutes or fractions of minutes per day, up to entire seasons.

For the most part, water prices were freely negotiated and agreed at local taverns by the farmers themselves, although brokers did arrange some transactions. In spite of this very free system, concern was raised by officials and non-trading farmers that trades would lead to speculation and higher prices, and eventually a reduction in farming. These opponents of the system demanded a return to the time when water rights were legally tied to land sales, to ensure that water was always used on local farms. These demands were not acted upon. However, attempts to communalise private rights to water were enshrined in the 1985 Water Law, under which rights considered private in 1985 remain so until 2060, when the right will revert to the state, and no new rights will be allocated. Under the 1985 Law, water use will be maintained by the issuance of licenses, the right remaining with the state.<sup>25</sup>

Water markets exist in other countries, including parts of North Africa,<sup>26</sup> South Africa,<sup>27</sup> and Brazil.<sup>28</sup>

### Water Delivery Services: The Role of Communities and Markets

Once water rights are defined, the delivery of water, either for irrigation, drinking, or industrial use can be done by the community itself or by hired private companies.

#### Kerala: Rural Drinking Water

The first community financed and managed piped water supply scheme was started in early 1980s in Kadalundi Panchayat (Mannoor model water supply project) of Kozhikode district. It is an example of how the government can move from a provider to a facilitator. This was

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<sup>22</sup> Sturgess and Wright (1993)

<sup>23</sup> Sturgess and Wright (1993), pp. 23–4

<sup>24</sup> Maas and Anderson (1978)

<sup>25</sup> Anderson and Snyder (1997)

<sup>26</sup> Landry (1999)

<sup>27</sup> Bate (2000)

<sup>28</sup> Kemper (1997)

perhaps the first initiative in rural India where the user communities were meeting the full capital and operation and maintenance costs of their drinking water schemes.

The Olavanna<sup>29</sup> gram panchayat in Kozhikode district had a drinking water scarcity problem. Olavanna presented a classic case of "water, water everywhere, but not a drop to drink." The three rivers, including Chaliyar, flowing through the panchayat are saline. The Gram Panchayat commissioned first piped water scheme in 1987 in Vettuvendankunnu Ward. Later five neighbouring families in the hamlet of Kambili-paramba pooled resources and installed a small one HP pump.

Encouraged by this initiative and supported by the panchayat president, 54 other households of Kambili-Paramba got together in 1989, and with a contribution of Rs. 4,500 each, formed a registered co-operative society to provide drinking water for their own needs. This was a piped water supply scheme consisting of an intake well, pump set, over-head tank and distribution system. 1991 onwards, several such private societies have been formed and similar small piped water supply schemes commissioned. Today, there are 26 such private co-operative societies operating in the gram panchayat and six more societies are in the process of constructing their schemes. The panchayat has successfully shifted its role from being a provider to a facilitator and it has performed the regulatory function to sustain and encourage this novel project for the last 11 years.

The panchayat does not provide any funds to these societies, as capital costs or for the operation and maintenance (O&M). It also needs to be noted that not a single private scheme has failed till date.

The process of initiating a private piped water supply scheme is as follows. After enlisting all households who wish to benefit from a piped water supply scheme, the beneficiaries get together, draft their by-laws and register their co-operative society. This process is facilitated by the gram panchayat, which in turn supports a group of individuals who are willing to mobilise the beneficiaries and take the responsibility of running the project in an open and democratic manner. Members of the society are asked to pay their membership fees, which varies from Rs. 4,500 to Rs. 12,500 per household. The amount differs across societies because the costs of individual schemes vary. Land is purchased for the open well and for the overhead storage tank. The location of the well is decided by consensus.

Once the scheme is ready, water is available 24 hours a day, except in the summer months of April and May. During this period, water supply is reduced by mutual agreement among the beneficiaries, to about 10 hours a day. As the users are also the managers, self-regulation brings in an element of responsibility and ensures that there are no unnecessary complaints.

The General Body (GB) of each society, consisting of all users (averaging around 50 households per scheme) elects an Executive Committee (EC) of 7-11 members, including a President, Vice-President, Secretary, and Treasurer. The EC is elected annually and runs the day-to-day affairs of the society. The Treasurer operates the society's bank account, and is answerable to the EC. The EC has to obtain the permission of the GB to utilise the society's funds, including the payment for the construction of the water supply scheme. Each year, a General Body Meeting (GBM) is held to scrutinise the accounts, discuss the annual report, and elect the EC for the following year. Transparency in everyday functioning is a critical factor

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<sup>29</sup> Water and Sanitation Program, "Villagers treat water as an economic good, Olavanna, Kerela, India," Write Media, PS Press Services Pvt. Ltd.

contributing to the sustainability of the society. Each Society has prepared detailed by-laws for efficient functioning.

Households who wish to join the scheme after it has been commissioned have to pay twice the initial membership fees to offset the initial risk taken and efforts made by the members who initiated the society. The beneficiaries pay all the O&M costs, including the cost of hiring a pump operator and energy costs. The society makes sure that there is an operating surplus for future repairs and maintenance. The due date for monthly payment is the 30th of the month. Payments are accepted till the 5th of the next month with a fine. But if the payments are delayed after the 5th, supply is disconnected. By and large, severance is rare.

This is perhaps the first instance in rural India where the local community is meeting the full capital cost as well as the O&M cost of a drinking water project. "It was difficult to pay the Rs. 5,500 needed for the scheme. But I paid it in three instalments over six months. And it was worth it. I have no drinking water problems now," says Khoya, a poorer resident of Olavanna.

In order to assist the poorer families, the societies accept their contribution in instalments. In some societies, the poor are given an opportunity to earn wages during the construction of the scheme that partly funds their contribution.

All members of a society must permit other members to lay pipelines through their property. However, this must be done without causing any damage to the property-owner. All members must take individual connections from the main line to their houses, at their own expense.

Water must not be used for irrigation under any circumstances. Storing water for irrigation, if detected, will invite penal action by the EC. However, a show cause notice must be issued to the member concerned before initiating any action. If a member sells his house, the water connection is also transferred. These sales must be intimated in writing to the EC. In no case will the EC pay back the initial contribution of the original member. The purchaser will automatically become a member of the society.

Each household is allowed 400 litres per day. Water meters are installed to check the consumption, and excess consumption attracts a penalty at the rate of Rs. 20 per 1,000 litres. This is indeed a remarkable achievement, for not only can the societies collect the full O&M costs, but they can also impose such high penalties for excess usage. This is in stark contrast to the experience of the water boards where meters are tampered, the O&M costs not paid, and where it would be impossible to regulate and restrict the use of water at critical times.

### **Drawing Spring Water: Pazhakulam, Kerala<sup>30</sup>**

More than 1150 springs have already been developed with the active participation of the community. It is interesting to note that more than 90% of the spring users are from the below poverty line category. 53% of the spring user's annual income ranges from Rs. 5001-10,000 (lowest income strata), 29.5% of them are from the income category of Rs. 10,001-15,000, and 8.4% are from the category of Rs. 5000 and below. Only 9.5% of them have an annual income of Rs. 20,000 and above.

Even though the springs are located in remote areas, the project was able to bring down the cost. The cost is considerably less than other water schemes implemented by PWD,

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<sup>30</sup> Kurup, K B (2001–2003), "Community management in rural water supply through the development of natural springs," IRC International Water and Sanitation Centre.

Irrigation, Rural Development and other organisations. This is mainly due to the adoption of simple technology (gravity flow), use of local materials, effective supervision by the water committees and NGO staff, no contracting system. This project has demonstrated that with active involvement of the beneficiary group and locally available materials per capita cost can be considerably reduced. In more than half of the springs (630), the per capita cost was below Rs. 200. In 314 springs the per capita cost was Rs. 201-300 and only in 22 springs the cost has exceeded more than Rs. 500.

Generally in the gravity scheme the annual O&M costs approximately Rs. 90 per family, where as the pumping scheme cost more than double. Each user family is expected to contribute Rs 5 every month towards the O&M cost. An O&M account is operated at the local post office or bank depending on the accessibility.

Water quality testing (bacteriological and chemical) has been carried out on a quarterly basis and the results are shared with the water committees and the community. The results are also discussed in the training sessions.

#### Cochabamba, Bolivia: Urban Drinking Water Supply

On advice of the World Bank, Cochabamba, a city of 800,000 in Bolivia, put its water system up for auction in 1999. Only one bidder showed up. The company, called Aguas del Tunari, a consortium led by London-based International Water Limited (IWL), which is jointly owned by the Italian utility Edison and US-based Bechtel Enterprise Holdings. The agreement guaranteed the company an average profit of 16% per year every year over the 40-year life of the contract.

In a few months after securing the concession, in November 1999, the company increased water rates so much so that people finally came out on the streets to oppose them. The protests lasted for several months, during which a 17-year boy got killed. Ultimately the government decided to cancel the contract and in April 2000 the company left the country. It however filed suit against the Bolivian government asking for \$25 million in compensation. The case is being heard in Washington DC in an arbitration court run by the World Bank.

Interestingly there are various versions of how much the water rate was increased by the private company. They range from 10% to 300%. Even after almost three years (Aguas left in April 2000), it is hard to determine what exactly happened in Cochabamba.

According to Jim Shultz of the Democracy Centre in Cochabamba, who also won a prize for his reporting of the protests, "Our own water bill, for example, leapt from \$12 per month in December to nearly \$30 in January. Similar increases hit almost everyone we know. By US standards that may not be much, but for the many Bolivian families who often earn as little as \$100 per month."<sup>31</sup>

Kayla M Starr writing in *Sentinet Times* stated "...water bills went up as much as 200%. Residents were enraged. Some people had to literally choose between buying food or water."<sup>32</sup>

Dr. Vandana Shiva states "where minimum wage was \$100 a month, water bills reached \$20 a month."<sup>33</sup>

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<sup>31</sup> The Democracy Center (2002) "Bechtel vs Bolivia Riley Bechtel's response," [www.democracyctr.org](http://www.democracyctr.org)

<sup>32</sup> Starr, Kayla M (2002), 'The Blue Gold Rush,' *Sentinet Times*, December.

<sup>33</sup> Shiva, Vandana (2003), *The World Bank, WTO and Corporate Control over Water*, Navdanya, p. 17

According to Didier Quint, the official spokesperson for Betchel in Bolivia, "The typical rates for water and sewage services rose 35 %. Low-income residents were to pay 10 % more and the largest hikes (106 %) were reserved for the highest volume users, the most affluent." <sup>34</sup>

Betchel's own reply:

Aguas del Tunari increased the water supply by 30 % during its first two months of operation and persuaded the government to reverse the rate structure, so that those who used the least water would pay the least per unit. It was the government, however, that set the rates. It was also the government that insisted that those rates be increased to cover not only operating costs, but also years of accumulated utility debt as well as certain unnecessary capital projects.

It is important to understand the difference between water rates (the unit rate paid for water) and water bills, which depend on the amount of water actually used. For the poorest people in Cochabamba rates went up little, barely 10 %. This is in contrast to the figures of 200 or 300 % that some have claimed. Unfortunately, water bills sometimes went up a lot more than rates. That is because as Aguas del Tunari improved service, increasing the hours of water service and the pressure at which it was delivered, people used a lot more water. Unfortunately, a campaign to inform residents of the changes and improvements to the service failed to prepare them for the shock of higher bills.

The protests were led by the Coordinadora de Defensa del Agua y la Vida (Coalition for the Defense of Water and Life). It now it seeks to channel the energies and creativity to find real alternative solutions to both corrupt public management and impoverishing privatisation of public services.

#### Andhra Pradesh: Irrigation Management by Farmers<sup>35,36</sup>

The Andhra Pradesh Farmers' Management and Irrigation Systems Act, 1997 (Act 11/97) was enacted to form farmers' organisations with a view to involve farmers in irrigation management and ultimately achieve irrigation management transfer to farmers. Elections were conducted in June 1997 and 10,292 Water Users' Associations (WUA) were constituted along with 174 Distributory Committees.

It is decided that out of Rs. 200 per acre collected towards water tax, Rs. 100 representing 50% of tax would be adjusted to the government account to meet the cost of infrastructure. Out of the remaining 50% i.e., Rs. 100 per acre, Rs. 10 will be adjusted to the gram panchayats and the remaining Rs. 90 per acre would be adjusted amongst Water Users' Associations/ Distributory Committees/ Project Committees.

Initial indications are that there is a significant increase in the state's irrigation area (510,000 ha or 10 %) in the 1998/99-kharif seasons. Over 73% of WUA presidents report an increase in irrigated area while a smaller sample had improved water distribution to tail-enders.

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<sup>34</sup> Schultz, Jim (2000), 'Bolivia's Water War Victory,' *Earth Island Journal*, Autumn

<sup>35</sup> Blackburn, James, R. Chambers, J. Gaventa, (2000) 'Mainstreaming participation in development', OED Working Paper Series No. 10.

<sup>36</sup> Indian Network on Participatory Management newsletter No. 11, (August 2001)

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