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WATER RIGHTS AND MULTIPLE WATER USES: FRAMEWORK AND APPLICATION TO KIRINDI OYA IRRIGATION SYSTEM, SRI LANKA

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ABSTRACT

The growing attention to water rights in recent years reflects the increasing scarcity and competition for this vital resource. Because rights are at the heart of any water allocation system, they are also critical for any reallocation. Not only efficiency, but also fundamental issues of equity are at stake. But just as water is a fluid and dynamic resource, flowing and seeping in many channels, so also water rights are fluid and dynamic, rarely a single, consistent system. To understand water rights requires going beyond formal statutory law (which may or may not be followed), to look at the many bases for claiming water. Because of the vital nature of this resource, state law, religious law, customary law and local norms all have something to say in defining water rights.

The delineation of water rights is further complicated when we take into consideration multiple uses (irrigation, domestic, fishing, livestock, industries, etc.) as well as multiple users (different villages, groups of farmers in the head and tail, fishermen, cattle owners, etc.) of the resource. These overlapping uses bring in different government agencies, as well as different sets of norms and rules related to water.

This paper provides a framework for examining the statutory and customary water rights of multiple users of water and applies it in the Kirindi Oya irrigation system in Sri Lanka, based on a multidisciplinary study conducted in 1997-1998. It demonstrates that the range of stakeholders with an interest in water resources of an irrigation system go far beyond the owners and cultivators of irrigated fields. As such, these groups are not only claimants on the ongoing management of water resource systems, but also need to be included in any considerations of transferring water from irrigation to other uses.

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WATER RIGHTS AND MULTIPLE WATER USES: FRAMEWORK AND APPLICATION TO KIRINDI OYA IRRIGATION SYSTEM, SRI LANKA

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1. INTRODUCTION

Irrigation systems are generally evaluated in terms of their ability to provide water for agricultural production, and valued in terms of the "crop per drop" produced. The large volume of water diverted, and even consumed, by irrigation, together with low world prices for wheat, rice, and other major crops produced on irrigation systems, usually lead to a relatively low estimated "values" of irrigation water use. In the current era of growing scarcity and competition for water, other water use sectors often have higher estimated values. Where developing new water supplies is difficult, expensive, or even impossible, there is pressure on irrigation systems—and on farmers of irrigated plots—to give up water to meet the growing demands of the municipal, industrial, and environmental uses and users. However, irrigation systems also provide water for a range of other uses, and include more than irrigated farmers as users. This includes other productive uses such as home gardens, livestock, fishing and aquatic products, and micro-enterprises such as brick-making. It also includes domestic uses often thought of as the domain of municipal water systems: drinking, cooking, bathing, washing, and even recreation. Finally, there are environmental uses, including recharging groundwater,

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flushing contaminants, and supporting wildlife. The quantities of water used in these activities may be small relative to total water diverted for irrigated crop production, but these uses have high values in terms of household income, nutrition, and health in rural areas. The importance of non-agricultural uses of irrigation water in livelihood strategies of communities in irrigation systems has implications for irrigation management and water rights, especially as increasing scarcity challenges existing water allocation mechanisms. Systems of formalized individual water rights are developing in response to increased competition for water. In the process of allocating formal rights, secondary water uses such as livestock, gardens, and other domestic micro-enterprises are often ignored and those who use water for such purposes lose access.

The purpose of this paper is to highlight some of the other uses of water in irrigation systems, and the various types of water rights that other users of water may have. In the second section of the paper, we provide a framework for examining the statutory and customary water rights of multiple users of water, and in the third section apply it to the Kirindi Oya irrigation system in Sri Lanka. The concluding section points to implications for conceptions of irrigation as well as for programs that seek to formalize water rights, or to reallocate water from irrigation to other sectors.

The empirical findings are based on a multidisciplinary study conducted in 1997-1998.[2] The study used a household survey of 156 households, stratified by old and new

[2] This study was conducted by the International Water Management Institute, International Food Policy Research Institute, and International Center for Research on Women under the System-Wide Initiative on Water Management (SWIM). See Bakker et al., 1999. We are grateful to our collaborators on that study, including Randolph Barker, Chatura Gunawardana, Wim van der Hoek, Peter Jensen, Flemming Konradsen, Fuard Marikkar, Yutaka Matsuno, Rekha Mehra, Manel Pushpalatha, and Parakrama

command areas. Water quality was measured for various sources throughout the system. Further, direct observations at standpipes and tanks were done and about 10 focus group discussions with, among others, women cultivators and clay pot makers were carried out to identify different categories of uses and users. Key informant interviews with government officials in the main agencies involved in water management, local politicians, and representatives from different user groups were carried out to derive the implications for management of the irrigation system.

CONCEPTUALIZING WATER RIGHTS

As with any resource, when water is abundant, there is relatively little attention to rights. But with increasing scarcity and competition for this vital resource in many places, there has been growing attention to water rights in the water resource management literature in recent years. Unfortunately, much of this literature has taken an overly narrow view of water rights, recognizing only formalized, statutory rights. But just as water is a fluid and dynamic resource, flowing and seeping in many channels, so also water rights are fluid and dynamic, rarely a single, consistent system. To understand water rights requires going beyond formal statutory law (which may or may not be followed), to look at the many bases for claiming water (see Benda-Beckmann, Benda-Beckmann and Spiertz, 1996; Meinzen-Dick and Bruns, 2000).

Weligamage. It also draws upon a number of other studies carried out in Kirindi Oya, especially Jeffrey Brewer's (2000) work on water rights and negotiation processes in the irrigation system.

Because of the vital nature of this resource, state law, project regulations, religious laws and values, and local norms all have something to say in defining water rights. While formal laws are important, they frequently fail to coincide with people's own perceptions of water rights and the ways in which water has been managed at the local level. If we begin with a definition of property rights as "*the capacity to call upon the collective to stand behind one s claim to a benefit stream"* (Bromley 1991:15, emphasis in original), we see that property rights are only as strong as the institution(s) that back them up. This requires attention to the mediating institutions that translate water rights (from whatever source) into actual access to water by implementing, enforcing, or modifying rules. Although governments have considerable power, they often lack the ability to enforce statutes, especially the ones governing a fluid resource such as water. Local institutions therefore play an important role.

Furthermore, most societies and religions have devised varying forms of rights and rules pertaining to who may use what kinds of water in what ways. Local norms and accepted practices may differ from all of the other types of "water law."

The anthropological literature on legal pluralism has much to offer in understanding this complexity of legal frameworks and the effects on the ways people use water. Legal pluralism begins from a recognition that multiple legal and normative frameworks coexist. For example, government, religious, and customary laws, project regulations, and unwritten local norms may all address who should receive water, from

which sources, for what purposes.[3] This approach has not only been instrumental in recognizing the multiple bases for claiming water, but also for understanding the relationship between law and social practice. Legal pluralism goes beyond dualistic opposition between "formal state law" and "local customary law" to look at the tensions and contradictions within and between interacting repertoires. Even within state laws, there may be contradictions, especially when different government agencies are involved in issuing regulations. Just as state laws cannot be assumed to be the only source of water rights, local or "customary" rules do not operate in isolation from state legal history, but instead the two are complexly intertwined. As a result, recommendations based on statutory rights alone—or on customary practices alone—do not adequately address the combination of technology and institutions which might contribute to improving water allocation in practice.

The concept of "forum shopping" is useful in analyzing how different water users refer to one or another legal framework as the basis of their claim, depending on particular circumstances. It also points to the limitations on policies and statutory legal changes that attempt to change rights too radically from locally accepted notions. Water users are likely to appeal to alternative laws or rules, or oppose the changes as inequitable.[4]

The delineation of water rights is further complicated when we take into consideration multiple uses (irrigation, domestic, fishing, livestock, industries, etc.) as

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[3] For applications of legal pluralism to water rights, see Benda-Beckmann, Benda-Beckmann and Spiertz , 1996; Guillet, 1998; Meinzen-Dick and Bruns, 2000; and Spiertz, 2000.

[4] For example, Guillet (2000) shows how farmers in northwestern Spain resisted government demand management policies, perceiving them as an infringement on their customary water rights.

well as multiple users (different villages, groups of farmers in the head and tail, fishermen, cattle owners, etc.) of the resource. This brings in multiple government agencies, as well as different sets of norms and rules related to water.

In addition to looking at the types of rights and sources from which they derive, it is important to consider the strength or robustness of those rights, i.e. the degree to which they can be defended (see Place, Roth and Hazell, 1993; Roth, Wiebe and Lawry, 1993). This is especially important in the case of water resources, because the available supply, as well as the demand, fluctuates from year to year. Stronger water rights will apply even during periods of scarcity—dry seasons and drought years, while weaker rights may be denied when water is scarce.

Despite the range of legal frameworks that apply, there may still be some water uses that are not recognized as legitimate in any of those frameworks (i.e., not recognized as legitimate by anyone except perhaps the users themselves). Thus, Pradhan and Pradhan (2000) argue for the need to distinguish between rights, which are legitimized use, and mere access to water without a recognized claim. The latter may be a case of open access (where no rights or management regime operates), or may be tolerated by the rights holders so long as it does not infringe upon their water use. As water becomes scarce, the open access or tolerated use is likely to lose out most rapidly, unless the users are able to establish their claim on the basis of long-term use or other means.

A starting point in dealing with this complexity is to go beyond simple concepts of "ownership", to look at the bundle of rights various users and management entities might have. A single user rarely has full rights to control, use, and dispose of water. Rather, different stakeholders have the right to use water for a certain purpose, or subject

to certain conditions. Schlager and Ostrom (1992) propose a useful classification of these bundles of rights in a hierarchy ranging from limited, short-term rights to extensive, long-term rights to the benefit stream, as follows:

- *access*: the rights to enter a defined physical property. This might apply to recreational water use (like swimming), where the main 'use' is simply to be in the water, but would generally apply only to non-consumptive, in-stream uses.
- *withdrawal*: the rights to obtain the benefits from that property by taking out some of the flow. In water resources, in-stream uses versus withdrawal right represent an important distinction.
- *exclusion*: the rights to determine who will (and will not) have access to the resource.
- *management*: the rights to regulate use patterns, thus transforming the resource and potentially altering the stream of benefits from that resource. Management rights also provide the ability to define access or withdrawal rights.
- *alienation*: the rights to sell, lease, or bequest rights to the resource.

Access and withdrawal are considered use rights, while exclusion, management, and alienation are rights of control over the resource. "Ownership" is often conceived of as holding the full bundle of rights.

With this hierarchy as a guide, it is possible to ask which types of water users are able to claim which types of rights, and what type of legal framework those rights (or

claims) are based upon. The next section presents the results of applying this framework to different water uses in the Kirindi Oya irrigation system in Sri Lanka.

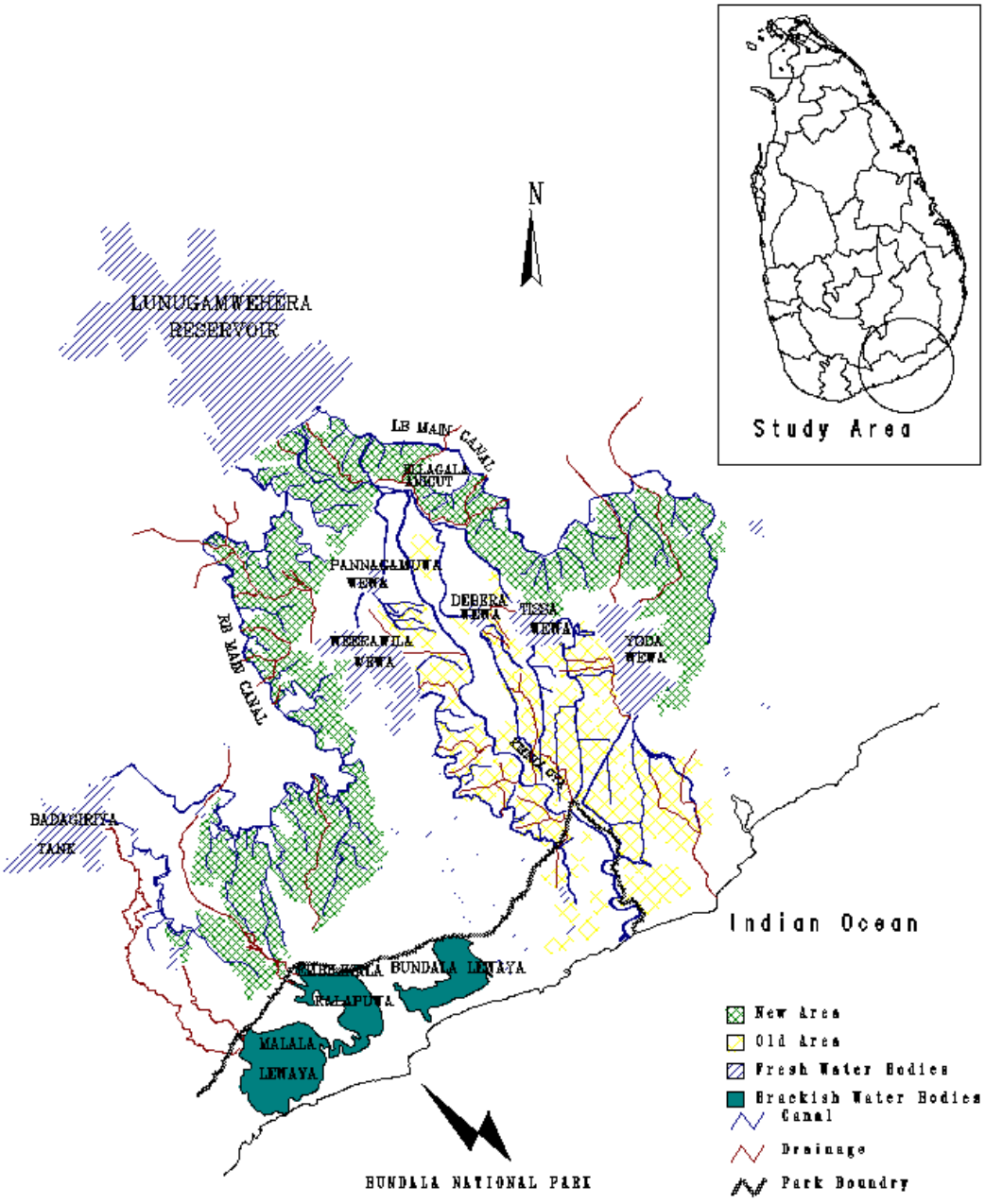
WATER RIGHTS IN KIRINDI OYA

The Kirindi Oya Irrigation System is located in the southeastern dry zone of Sri Lanka, about 260 km from Colombo. Rainfall averages 1,000 mm per year, with about 75% falling in the Maha season (October to April), and 25% in the Yala season (April to October). Evaporation is uniform throughout the year, with an annual average of around 2,100 mm (Bakker et al. 1999).

The system consists of an old and a new irrigated area. The five tanks, or small reservoirs, under the old Ellegala system were built over a thousand years ago. The construction of a larger reservoir upstream was finished in 1987 and expanded the irrigable area to 5,400 ha of newly developed lands, in addition to the 4,200 ha of land under the old Ellegala system and the 850 ha of land under the Badigiriya irrigation system. The drainage water from the new area and the Badagiriya system is flowing into lagoons that are part of the Bundala National Park (see Figure 1 for a map of the study area).

The total population of the study area is approximately 87,750, with about 30% in the new area. The old area is more urbanized, with settlements that have existed for centuries. Within the old area are several important Buddhist sites that have become pilgrimage centers. Further, many pilgrims pass through the area on their way to important temples in Kataragama to the east. In the new area, 5,200 families were settled during the 1980s. About 55% of the residents in the new area acquired land because of being

Figure 1: Badigiriya irrigation system



displaced from the area when the system was built, the other 45% came from other parts of the country under a government program to allocate new irrigated land to the landless.

According to statutory law, the Sri Lankan government claims legal ownership of all surface water and does not recognize any system of individual or group water ownership rights. However, as in most places with centuries of experience with irrigation, there are local notions of rights to water for different tanks and for individual users within the tank command areas, which have been used to argue for customary rights to water, e.g. in the old areas of Kirindi Oya, as discussed below. Because the strong link between water use and household livelihood is recognized by local people, there are also norms of allowing certain uses that are considered necessary for a household, even if there is no formal statutory or customary water rights, when "there is no other source." This type of use is highly situation-specific, and depends on the relations between households and their knowledge of each others' circumstances. Furthermore, Buddhist religious norms and values affect access to and use of water, especially by pilgrims who come to the area to visit the shrines and temples or stop on their way to Kataragama.

Even within the government, different agencies' regulations (or the interpretation of different officials within an agency) may vary. The overlap of various hydrologic units and administrative boundaries provide further complications. The Kirindi Oya Irrigation and Settlement Project falls within Southern Province, but the main reservoir and the catchment area falls within Uva Province. The Central Government (parliament) in Colombo has legislative and executive powers over the entire system. The Kirindi Oya river basin falls within 3 districts and 7 divisions, and the Kirindi Oya irrigation system, including the reservoir (area of study), falls within 2 districts and 4 divisions.

The Project Management Committee is the main organization involved in water allocation in Kirindi Oya. This is a joint government-user group entity composed of the various government departments and representatives of the Farmers' Organizations (FOs) in the irrigation command area and representatives of Cattle Owners' Farmer Organizations (Meinzen-Dick and Bakker, 1999). Until 1991, allocation decisions in the Kirindi Oya irrigation system were made by the officials without direct input from the farmers. According to Brewer (2000), making the Project Management Committee responsible for seasonal allocation decisions made the decisions more acceptable because farmers had some input. The Project Management Committee's authority was also accepted by government officials because of the government's participatory management policy (Brewer, 2000).

The major types of water use in Kirindi Oya include field crop production, homestead garden cultivation, fisheries, livestock, domestic uses, micro-enterprises, and wildlife. However, the same household may be involved in different types of water use. For example, an irrigated farming household may also use water for a household garden, domestic use, and fishing (though different members within the household may have different stakes in each type of use). At the same time, each use category is not necessarily homogeneous. Irrigated farming households have different types of rights, depending especially on whether they are in the old or new areas. Business enterprises include a few major companies as well as a host of micro-enterprises. The rights of the main categories of uses and users are summarized in Table 1, and explored in more detail in the remainder of this section.

Table 1: Summary of water rights for different types of uses and users in Kirindi Oya Irrigation System.

Use	Users	Proximate Source	Basis of claim	Rights	Mediating institutions
Field irrigation	Old area farmers	Canals	Customary use Recognized by government	Strong use Some management, exclusion	Land ownership PMC FOs
	New area farmers	Canals	Government allocation	Weaker use	Gov't land allocation PMC FOs
Garden irrigation	Mostly women	Wells Canals, stand-pipes	Well ownership Proximity	Use, management of available g.w. Tolerated use	Well ownership Local norms
Livestock	Pastoralists	Tanks, canals	Historic use not recognized by project	Tolerated use	COFO (not active in water issues) Divisional Secretary
	Farm households	Tanks, canals	Needed for livelihood	Tolerated use	Local norms
Fishing	Mostly male farmers, part-time	Reser-voir, tanks	Use over time Membership in FCS	Use and exclusion, but right to manage water not clear	FCS (not in PMC)
Domestic	Old area households	Wells canals	Customary, necessary use Special allocations from reservoir	Recognized use, but not as strong as for new areas	PMC reserves water for special water issues in dry season
	New area households	Stand-pipes, canals	Reservoir allocations for water system Membership in standpipe committee Payment of fees	Strong use Some exclusion, no recognized management	NWS&DB (not in PMC) Standpipe committees, local norms
Business enter-prises	Major (e.g. garment factory)	Piped water	Allocations from NWS&DB	Clear use	NWS&DB
	Minor (e.g. bricks, clay pots)	Tanks, canals, stand-pipes		Tolerated use, no management	
Environ-mental	Wildlife	Tanks, canals		Tolerated use, no management rights	Dept. of Wild Life Conservation (not in PMC)

Notes: FOs = Farmers' Organizations
PMC= Project Management Committee
COFO= Cattle Owners' Farmers' Organization
NWS&DB= National Water Supply and Drainage Board
FCS= Fisheries Cooperative Societies

FIELD CROP PRODUCTION

Water use rights for irrigation are allocated to land in designated irrigated areas through a process of seasonal planning or allocation (Brewer, 2000). The Irrigation Ordinance defines mechanisms for seasonal water allocations but adds that all decisions are subject to review and change by the government. The final authority is the Minister in charge of irrigation (IIMI, 1995b). The seasonal planning which is used to allocate water for agricultural purposes in Sri Lanka is recognized by both custom and law. Within this allocation model there is considerable scope for negotiation (Brewer, 2000).

Water rights tied to irrigated land are one of the most widely recognized forms of water rights in Sri Lanka, and particularly in Kirindi Oya. This principle exists in both statutory and customary law. It is not only that land in the designated command area is entitled to irrigation and other land is not, but land in various parts of the command area have differing priorities for irrigation in different seasons.

There are differential group rights to irrigation water in the old and new areas. When the new Kirindi Oya Irrigation System was developed, the farmers of the old area argued that they had a customary right to irrigation in both seasons, and that the new system should not infringe upon their rights by reducing the water available to them. The government recognized the seniority of existing (customary) water rights of farmers in the old areas. Those farmers were assured that their water use would not be reduced by the project, and in fact, would be able to increase their cropping intensity due to more reliable water supplies from the new reservoir. They were assured they would receive water to irrigate paddy on 100 percent of the old area command in the Maha (wet)

season, and 70 percent of the area in the Yala (dry) season, whereas the new area would get water for paddy on only 2/3 of the area in Maha and the remaining 1/3 would get priority for non-paddy crops in Yala, if water were available.

The Project Management Committee (PMC) is the main mediating institution, translating water rights into water deliveries by allocating water for agricultural purposes. This is done by negotiated seasonal planning, that adjusts water allocation to water availability. The two generally recognized principles underlying water allocation for irrigation are: (1) equity of water distribution, defined as ensuring that every farmer gets water in proportion to his landholding within the command area; and (2) priority to standing crops over those not yet planted. While these are generally accepted principles, the application of these principles in each year has been considerably contested between the various (irrigation) user groups. Based on the guarantee that they would not receive less water after the construction of the system,[1] especially in the early years, the Ellegala (old area) lands were given priority for water during drought, even if it meant that the new areas did not get any. This is an indicator of the strength of the customary rights of the old area farmers, reinforced by government recognition, especially in the early years of the project. However, in later years the new area farmers have gained a somewhat stronger voice in the PMC, which has helped them in getting more favorable water allocations, though still not as strong as in the old areas (Brewer 2000).

Individual rights to water are tied to land rights. Generally, farmers in the old area own their homestead and irrigated land, while settlers in the new area have been

[1] This was a verbal guarantee by government officials in meetings with the farmers, and though the documentation appears to be unclear, it has held considerable force.

allotted management and use rights by the government. Alienation rights to land for settlers were limited: they could not legally sell or lease it, and while it could be inherited, the land could not be divided between heirs (Stanbury, 1989). In addition to irrigated land and homesteads, farmers may also have use of chena (highland) or un-irrigated plots, which are used on a seasonal basis. Nevertheless, because of water shortages and low productivity of the system in early years, many settlers in the new area migrated, abandoning their plots, either returning to cultivate only on a seasonal basis, or allowing someone else to cultivate their land.

As individual water users, farmers with land in irrigated areas have use rights to water on their fields. The source of those rights is both statutory law (e.g. the Irrigation Ordinance), project regulations, and customary use. The old area farmers have stronger use rights than those in the new areas, and have even, in some seasons, used this to exercise exclusion rights by restricting the water available to the new areas. Through participation in the FOs and PMC, farmers have also acquired some management rights. The strength of these rights depends on the rights of the farmer groups in the old versus new areas, the degree of participation of the individual farmers in the FOs, and the strength of Farmer Representatives' voices in the Project Management Committee.[2] Nevertheless, farmers' interests in water for field (especially paddy) crop production is better represented than any other type of use in allocation decisions.

[2] Brewer (2000) documents how, when Ellegala farmers chose not to participate in the PMC, allocations were made favoring the new areas. In the next year, Ellegala farmers selected new representatives and were once again active in the PMC.

HOMESTEAD GARDEN PRODUCTION

Often dismissed as "kitchen gardens," homestead gardens are significant in terms of economic and nutritional value, area, and even water consumption. These horticultural production systems that include coconuts, mangoes and other fruits plus a variety of vegetables are an important source of household nutrition, fuelwood, and income. Gardens also provide shade and coolness, an escape from the tropical sun. This is especially true for homesteads in the old area, which are better landscaped with vegetables, fruit trees, and other permanent vegetation (IIMI 1995a). Moreover, whereas irrigated field crops involve both men and women of the household and the produce is generally under male or joint control, garden production (and the income from it) is generally under the control of the women of the house. Although each individual homestead may be small, together they cover substantial areas. Water balance studies indicate that the gardens and especially permanent vegetation around the homesteads and surrounding areas in Ellegala account for almost twice as much evaporation (water consumption) than the irrigated field crops (Renault, Hemakumara and Molden 1999).

Although cultivation of homestead gardens is a longstanding practice (dating back centuries in the old areas), there is no recognized water right for homestead gardens. To the contrary, taking water from either the irrigation canals or piped domestic water supply for gardens is prohibited by the government. Taking groundwater from private wells, however, is not regulated,[3] and the development of “agro-wells” is even promoted by the

[3] No legislation exists on groundwater abstraction and use. The only legal provisions relating to groundwater are those prescribing the mandatory fencing of wells

Agricultural Development Authority. Runoff or wastewater from domestic use is applied to gardens, and water may occasionally be taken directly from domestic supply pipes, which is not sanctioned. Because gardens are an important part of household livelihood strategies for most people in the old and new areas, a certain amount of watering gardens from canals or domestic supply systems is a tolerated use. Thus, the only rights for gardens are use rights deriving from local norms and from ownership of private wells. However, garden production is treated as an individual use, and there is no user group to represent its interests.

Livestock

Livestock is an important enterprise in both the old and new areas. The main difference among the users is between those households with large herds who depend primarily on livestock income, and those with agricultural land who keep some animals for draft, supplemental nutrition, or income. Before the project, there were a number of traditional herders in the area who used a combination of jungle and fallow fields for grazing, and a combination of small tanks and other sources for water. These herds were not taken into account in the original project plans, which caused problems when the scrub jungles and small tanks were razed to create the new irrigated area, and fallow periods were shortened by the second season cultivation (IIMI, 1995a). The herders have modified their grazing and watering patterns to include migration to nearby jungle areas during wet periods and return to villages during dry (fallow) periods.

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and pits by the occupier of the land on which these wells and pits are situated, and prohibiting the establishment of refuse dumps, waste injection wells and the use of land for waste disposal as to adversely affect groundwater (unpublished information).

The water use rights of livestock are informal and not clearly defined. The fact that customary cattle watering places were not recognized in the development of the Kirindi Oya system is an indicator of the relatively weak water rights for livestock. Within the system, water is not specially allocated or issued for livestock uses like drinking and bathing. The Cattle Owners' Farmer Organizations (COFO) are represented in the PMC, but their participation in that forum is primarily to resolve disputes due to cattle damage to crops. Because it does not involve water allocation decisions, their membership in the PMC does not provide them management rights over water. Thus livestock owners have customary use rights, but these rights have not been very robust in the face of the Kirindi Oya irrigation project development.

Fisheries

There are a variety of government, NGO, and user organizations involved in fisheries, but there is no coherent policy towards water use for fishing. Fishermen are organized in Fisheries Cooperative Societies (FCS) for each tank. Reservoir and tank fishing rights are legally restricted to FCS (Steele, Konradsen and Imbulana, 1997). Government assistance to fishermen is channeled through those Cooperatives and these organizations are responsible for checking if fishermen stick to the rules (such as the size of holes in the nets).

Keeping the water in the tanks at a certain level contributes to the fisheries, because when water levels are low, fish are concentrated and too many are harvested, depleting stocks for the future. During interviews, fishermen indicated that fishing is not taken into account when water allocation decisions are made. However, the fishermen do

not seem to make an issue of this. Because most have agricultural land, they consider fishing as a secondary activity and a subsidiary use of water, while the first and most important activity is agriculture. They feel that agriculture has the first right to water.

Fishing, as a non-consumptive use, requires access to water of a certain quality and quantity and withdrawal of fish. These rights are regulated through the FCSs, whose members have government-recognized use and exclusion rights. However, because they do not have a voice on the Project Management Committee for regulating water levels, fishers do not have management rights over water.

Domestic uses

At first glance, domestic water supply is one case in which new area households appear to have stronger water rights than in the old area. Households in the old area have relied on individually owned wells and use of irrigation facilities for their domestic water supply needs: usually drinking and cooking water from wells, and bathing and washing in canals or tanks. Because of problems with groundwater fluorosis, the new area could not use wells for drinking water. Thus, a piped water supply system was built which supplies treated water from the main reservoir for a couple of hours per day. It primarily serves the new area, a number of businesses, and some parts of the old area. However, households using water from standpipes are restricted in the amount they can draw, and are only to use it for drinking and cooking. Washing and bathing are still to be done in the irrigation system. Because water in the standpipes is restricted in quantity and uses, and because there is less availability of irrigation water for bathing and other domestic uses in the new area, the piped water supply system does not provide much of an

advantage to the inhabitants of the new area in terms of quantity. In terms of water quality, the availability of piped water supply does make the inhabitants of the new area better off than the people in the old area.

Although the Irrigation Department was nominally responsible for construction of the water supply scheme, responsibilities were surrendered to the National Water Supply and Drainage Board, and that organization continues to be responsible for domestic water supply distribution through the piped system (IIMI, 1995a). In Kirindi Oya, a certain amount of water from the main reservoir is set aside for domestic water supply. Most of this is a fixed allocation to the NWS&DB to operate the piped water supply system. When there is no irrigation going on, the Irrigation Department issues water once in fourteen days for domestic purposes. In Yala season of 1992, water issues for irrigation were even stopped in early July to protect domestic water supply (Brewer, 2000). This is an indicator of the priority given to domestic water supply. However, this led to serious conflicts because farmers demanded for more water releases for crop irrigation and politicians became involved in trying to settle the disputes (Brewer, 2000). These conflicts resurfaced in 1995 and 1997.

When water level of the Lunugamvehera reservoir is above dead storage level (i.e. 150 feet above MSL), NWS&DB has the right to extract 5000m3 of water per day. When the water level is at or below 156 feet above MSL, only the NWS&DB has the right to pump water from Lunugamvehera reservoir. So, the Irrigation Department is required to keep at least 6 feet of water above dead storage level of water in the reservoir for domestic uses. Further, a water right to abstract 600m3 from two tube wells at Kirinda town is granted to NWS&DB to supply the Ellegala complex. NWS&DB also has a right

to abstract water from Tissawewa tank to provide for 15 standposts and 806 households (unpublished information from the Water Resources Secretariat). However, it is noteworthy that the NWS&DB is not represented on the PMC.

On the users' side, standpipe committees of approximately 15 to 20 households have been established under the supervision of the NWS&DB to manage stand posts for piped water supply. These associations are informal, i.e., no authority is vested in them under existing legislation, although they are responsible for collecting user charges (a fixed fee of Rs 11 per month/household[4]) from the households who make use of the standposts. It is also the responsibility of the members of the standpipe committee to safeguard the water stand, and the committee is liable for the misuse of water by the standpipe users. If the users do not pay the fees and stick to the rules and regulations set by the NWS&DB, the water is disconnected and a re-connection fee of Rs 250 has to be paid by the committee.

Those rules and regulations specify that water from the standpipes can only be used for drinking purposes. During key informant interviews and focus group discussions, other uses like bathing, business use and washing clothes were reported. The users allow each other to use standpipe water for these kinds of purposes when there is no other water source nearby. They also reported that priority is given to pilgrims for drinking and bathing, at standpipes as well as in canals, because of religious norms.

[4] At the time of the study 1 US dollar = Rs 58.8

The formal rules grant members of standpipe committees limited use rights, and rights (which they may or may not exercise) to exclude non-members, or those members who do not pay. However, the rules are specified by the NWS&DB, so that users have no formal management rights. Informally, however, each group decides what uses will be tolerated or even considered legitimate, so there are some de facto management rights.

Those who draw their domestic supplies from sources other than the NWS&DB system have acknowledged rights to water through special reservoir releases even when there is no irrigation. In the faced of severe water scarcity, the robustness of this right depends on the negotiations in the PMC, where domestic users are only represented by the NWS&DB, not by any user group. Beyond this, there is much less regulation of domestic use. Access and management rules may be set by well owners, or by general consensus among bathers in a canal, with local norms playing a significant role.

Other Enterprises

There are a few large businesses and other enterprises in the Kirindi Oya area, and a host of smaller ones. Larger enterprises have generally obtained water permits from the NWS&DB, and draw their water from the piped supply system. The Air Force has a water right of 2000m^3 per month from NWS&DB. There is one garment factory in Kirindi Oya, with a water right of 1300m^3 per month from NWS&DB. According to the Irrigation Department, a number of hotels have requested water, but have been denied permission to take from tanks and other surface sources. They therefore turn to groundwater abstraction, which is less regulated (although the Irrigation Department notes that this water ultimately comes from the irrigation system). Water is not

especially allocated for small-scale enterprises like clay pot making and brick making. People make use of the available water, which has been allocated for other purposes like irrigation and drinking. Local norms allow for obtaining water for business or factory use only if it is a small-scale enterprise and if other income generating activities are lacking. No user groups were encountered representing the water interests of industrial or micro-enterprise water users. Thus, water rights for businesses range from relatively strong rights derived from NWS&DB permits, to weak customary use rights, to unauthorized abstraction, but none of these include management rights.

Environmental Uses

Although the water of the Kirindi Oya Irrigation System is used by quite large numbers of wildlife (especially birds) and flows into a national wildlife sanctuary, no special water rights and allocation is granted to recreation wildlife and the environment. Moreover, although there are strong interactions between the outflows and drainage from the Kirindi Oya system and the water quantity and quality in the Bundala sanctuary, the Department of Wildlife Conservation is not represented on the PMC. Although the sanctuary is a registered wetland protected by the international Ramsar Convention, this does not provide effective water management rights.

Conclusions and Implications

Recognizing that irrigation systems supply water for more than field crops complicates our analysis and practical approaches to water allocation in a number of ways. Instead of seeing water only going to paddy fields, we see it irrigating gardens, permanent vegetation, watering animals, producing fish, and supporting a range of

enterprises. No longer is "drinking water" the sole domain of municipal water supply systems, for irrigation systems are critical sources of domestic water in many rural areas. The range of stakeholders with an interest in water resources of an irrigation system goes far beyond the owners and cultivators of irrigated fields. While the amounts used by these other uses may be small relative to irrigation, they can have a very high value, both in quantifiable economic terms, and especially in terms of livelihoods for the rural poor (see Chambers 1988). Furthermore, water quality and reliability issues are likely to be much more important for these other uses, for unlike field crop irrigation, most other uses require water throughout the year.

This has implications for how irrigation systems are built and managed. Where livestock, fishing, or bathing are important users of water, special facilities such as bathing pools or reinforced banks might be included to accommodate these other uses. Water quality issues also require greater attention when fish, livestock, and especially human domestic uses are important. Instead of maximizing irrigation efficiency, or "crop per drop," it might be preferable to allow seepage that recharges the groundwater for wells that supply drinking water, gardens, or livestock. Particularly during times of scarcity, water might need to be held in reserve for some uses, as seen in the negotiated seasonal allocation in Kirindi Oya.

As scarcity and competition for water have become important issues in more and more places, issues of water rights and allocation have moved from a peripheral issue to center stage. Conventional approaches to water rights have tended to focus only on rights as defined in statutory law, overlooking the importance of a host of customary and

religious law, as well as local norms and other regulations. In the process, they have also overlooked the rights and claims of many "secondary" water users.

Instead of a singular approach to water rights, this paper proposes a framework for looking at pluralism in water rights. This pluralism implies looking for many different:

- uses of water;
- users of water;
- bases for claiming water rights;
- bundles of rights (rather than simple "ownership");
- stronger and weaker rights; and
- institutions that ensure or mediate the extent to which rights are realized.

Applying this framework to Kirindi Oya, we see that many uses that have no statutory rights (or are explicitly banned by government regulations) are tolerated because of local norms that recognize the importance of those uses for people's livelihoods. "We allow it because they need it and there is no other source" is a recurrent theme in the focus group interviews. Such norms of tolerating certain uses may not appear in any formalized system of water rights, but may nonetheless play a central role in conceptions of equity in water allocation.

The non-irrigation uses of water are not only claimants on the ongoing management of water resource systems, but also need to be included in any considerations of transferring water from irrigation to other uses. Because rights are at the heart of any water allocation system, they are also critical for any reallocation. At present, discussion of reallocation of water from agriculture to municipal or industrial

uses is often treated as a question of efficiency. However, not only efficiency, but also fundamental issues of equity are at stake. If water is reallocated, farmers may be compensated for the imputed value of the water they give up, and may even be involved in the negotiations over the transfers. But what happens to the other water users? Rosegrant and Binswanger (1994) mention addressing "third party effects" of water transfers as essential, but too often these issues are brushed aside or incompletely addressed. For example, are provisions made to maintain water in the reservoirs for fish, or to continue supplying water for domestic uses and livestock? Are these other users consulted or compensated? It is likely that, unless their rights are recognized, the answer to these questions will be "no."

Kirindi Oya Irrigation System is in the lower part of a water basin, with little urban or industrial development. It thus faces little risk of water being reallocated from the irrigation system for other uses, although a proposed oil refinery on the coast could change this. Furthermore, many of the different uses are by the same households that have irrigated fields (though gender and intra-household differences among the users imply that not all will have the same preferences on how water is used). However, other irrigation systems in peri-urban areas are likely to have at least as many different water uses and even more heterogeneous user groups. In such cases, taking a multi-faceted approach to recognizing water uses, users, and types of water rights is likely to be even more important to ensure the participation of all relevant stakeholders in the negotiations over any water reallocation from irrigation to municipal and industrial uses.

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