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Formal Water Rights in Rural Tanzania: Deepening the Dichotomy?

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Barbara van Koppen

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International Water Management Institute

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The authors: Barbara van Koppen is a Principal Researcher at the International Water Management Institute (b.vankoppen@cgiar.org); Charles S. Sokile is a Research Associate and Ph.D. student in RIPARWIN, Sokoine University of Agriculture (sokile@email.com); Nuhu Hatibu is Regional Coordinator for the Soil and Water Management Network for Eastern and Central Africa and Associate Professor, Sokoine University of Agriculture (n.hatibu@cgiar.org); Bruce A. Lankford is a Senior Lecturer in Natural Resources at the School of Development Studies, University of East Anglia, UK (B.Lankford@uea.ac.uk); Henry Mahoo is Team Leader of the Soil-Water Management Research Group, Sokoine University of Agriculture, Tanzania (hmahoo10@yahoo.co.uk); Pius Z. Yanda is Associate Research Professor at the Institute of Resource Assessment, University of Dar-es-Salaam, Tanzania (yanda@ira.udsm.ac.tz).

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Summary

In the past decade the Tanzanian government, with a loan from the World Bank, designed and implemented a new administrative water rights system with the aim of improving basin-level water management and cost-recovery for government water-resource management services. This paper evaluates the processes and impacts after the first years of implementing the new system in the Upper Ruaha catchment. In this area, the majority of water users are small-scale irrigators and livestock keepers who develop and manage water according to customary arrangements, without much state support. Although water resources are abundant, growing water demands intensify water scarcity during the dry season. Contrary to expectations, the new system has failed as a registration tool, a taxation tool, and a water management tool, and has also contributed to aggravating rural poverty. As a taxation tool, the system not only introduces corruption by design, but also drains government coffers because the collection costs are higher than any revenue gained. As a water management tool, the new system aggravates upstream-downstream conflicts, because the upstream water users claim that paying for water entitles them to use it as they like. However, unlike these and other counterproductive impacts of the new system, the taxation of the few private large-scale water users according to negotiated rates appeared to be feasible. The paper argues that the root of these paradoxical results lies in the dichotomy between the ‘modern’ large-scale rural and urban economy with its corresponding legislation and the rural spheres in which Tanzania’s majority of small-scale water users live under customary water tenure. While the new water rights system fits the relatively better-off minority to some extent, it is an anomaly for Tanzania’s majority of poor water users. This paper concludes by suggesting easy adaptations in the current water rights system that would accommodate both groups of water users, improve cost-recovery for government services, mitigate water conflicts and alleviate rural poverty.

1. Introduction

Since the mid-1990s, the Tanzanian government has been implementing pilot experiments of an unprecedented form of water rights and fees in the Rufiji and Pangani basins, with the two-fold aim of improving cost-recovery for basin-level water management services and fostering the wise use of this precious scarce resource (World Bank 1996). The new water rights and fees system concerns anyone who diverts and abstracts even the smallest quantities of surface and groundwater for productive uses. This form of government taxation is additional to the partial or full cost-recovery for infrastructure construction, operation, and maintenance in state-supported irrigation schemes. The fee also concerns all water users who invest privately in water infrastructure. In the new water rights and fees system, all water users or groups of users are obliged to register with the Ministry of Water and Livestock Development to obtain a 'water right'. This is a certificate indicating the purpose and an annual volume of water resources to which the right holder is entitled. Water users have to pay an application fee at the moment of registration of the water right equivalent to US\$40, plus an annual 'economic water user fee', proportionate to the volume allocated and depending upon the purpose of the water use. The minimum flat rate for uses up to 3.7 l/s for the annual economic water fee is US\$35.

Simultaneously, the government started promoting stronger user participation in the river basin Water Boards, which were fully governmental up to the mid-1990s. It also initiated the establishment of Water Users Associations (WUAs) at the lowest tiers, which were expected to manage water for multiple uses at village and ward level and were to be represented at higher levels, up to the basin level. Thus, water pricing was intended to go hand-in-hand with stronger user participation in the newly established institutions and better accountability and service delivery by government officials (World Bank 1996). In the same period Tanzania also introduced cost-recovery for other government services, such as domestic water supply, health services and education—radically breaking off with the socialist past in favor of privatization. Payment for services is especially relevant with regard to the financing of Tanzania's well-established but under-sourced local government and other local activities in rural areas since its independence in 1961.

With all ingredients present for what was then seen as the best practice of integrated water resources management, the results of its implementation, which emerged in the early 2000s, appeared disappointing indeed. This was apparent in the Rufiji Basin, in particular in the Upper Ruaha Catchment in South West Tanzania. This was one of the basins in which the River Basin Management (RBM) Project, funded by a loan from the World Bank, implemented the new system on a pilot basis. The large majority of water users in this area are livestock keepers and smallholders, who manage their self-constructed and self-financed schemes without any state support. During the three to five driest weeks of the year, water scarcity problems have been aggravated by the growing population and water demands. Among this majority of water users in the Upper Ruaha, neither of the two goals of cost-recovery for water management services by the government nor wiser water use were being achieved. The new system cost the government more than it generated. It fueled rather than solved local upstream-downstream water conflicts, while the customary water management principles upon which arrangements for better sharing of the limited quantity of water could have been grafted were eroded. Poverty was aggravated. As 64 percent of the total irrigated area of Tanzania is estimated to be farmer-managed (Ministry of Agriculture and Food Security/JICA 2003), the findings and recommendations from the Upper Ruaha sub-basin are relevant for the large majority of Tanzania's small-scale water users and agricultural growth.

This paper aims, first, to describe the factual processes and resulting impacts of the new water rights system in the Upper Ruaha catchment. Second, it aims to identify feasible changes in the system to enhance the likelihood that it will provide the government with much-needed funds for public services, effectively solve water conflicts, and alleviate rural poverty. It is argued that the key reason for the existing problems is the failure to recognize the persisting dichotomy of formal and informal socio-economic and political spheres and the accompanying legal systems in Tanzania, and indeed in other developing and ex-communist countries (De Soto 2000). The formal spheres and their legal systems were initiated by colonial settlers and pursued and adapted by the government after independence. These formal laws suited the needs of the large-scale water users of the colonial era and later of the urban-based and industrial users. However, they are inappropriate for the large majority of the rural and still urbanizing migrant population, who are typically small-scale water users. In many cases among the latter, effective informal local water tenure systems exist which are often rooted in the tribal structures of pre-independent Tanzania, but which have absorbed new forms of water management introduced via the elected local government or introduced by farmers themselves, for example, during the adoption of new technologies (Mamdani 1996; Maganga et al. 2003).

Section two attempts to briefly sketch the dichotomy between what can be called ‘urban and rural large-scale water use’ versus ‘rural small-scale water use’, as manifest in Tanzania’s water legislation since 1923. It also highlights how the new water rights system was grafted onto the formal system, assuming that the blanket application of one formal system would automatically suit rural small-scale water users. More specifically, the existing formal water rights system, consisting of highly centralized water authorities maintaining a dormant administrative system of paper water rights and registration, was expected to immediately serve the purpose of taxation and generate revenue for the self-financing of the basin-management, and the management of water as an economic good among large-scale and small-scale water users throughout the basin alike.

The three subsequent sections evaluate in detail the implementation processes on the ground in the Upper Ruaha basin, analyzing the new water rights and fees system as a registration, taxation, and water management tool. Section three shows that the new system remains an incomplete and error-prone registration tool, in particular, among small-scale water users. While compiling lists of names of water users is feasible, identifying the location of users is more difficult, and any objective estimate of volume is impossible. Without the bureaucracies, maps, and measuring devices required, the elusive natural resource, water, characterized by huge variation and unpredictability in an environment where water control infrastructure is largely non-existent, cannot be captured in cadastre records—even if it had been worth the costs and efforts of maintaining such a register.

A weak registration tool is a shaky foundation for a taxation tool, as elaborated in section four. The assessment of the average annual abstracted volume as a basis for taxation and fee collection is inevitably purely subjective and therefore highly corruption-prone. Further, Water Officers operate outside transparent and accountable public procedures of administering and handling collected funds. On top of this, among small users, instead of generating revenue, the government loses financially—the costs of registration and collection of taxes exceed the revenue collected from the majority of small farmers and pastoralists. Finally and not surprisingly, the new water rights and fees system lacks any legitimacy on the ground. Rural communities fiercely contest payment that is not matched with an improved service delivery.

As elaborated in section five, the new water rights and fees system appears even counterproductive as a water management tool, both among large-scale and small-scale water users. First, both *de jure* and *de facto*, administration-based paper rights are largely ineffective in regulating

actual water allocation. Governmental representation on the ground is too thin to effectively mediate in upstream-downstream conflicts, even assuming that Water Officers maintain sufficient credibility once their primary role as water managers changes into that of just tax collectors. Second, in reality, the new system has the opposite effect than intended—it aggravates downstream water deprivation. Converse to the assumption that valuing water leads to the reduction of water use, the well-organized water users located upstream now use more water because—as they state— “they have paid for it.” These unprecedented claims deprive the downstream users even further, whereas earlier, downstream communities could have appealed to customary and other water management arrangements to defend their case. Third, the new system fails as a water management tool because it is based on the incorrect diagnosis that water scarcity in this area is only a matter of physically scarce resources, for which the only solution is to divide the limited ‘pie’ (available supply). Yet, the core issue in Tanzania, as in many other countries in sub-Saharan Africa, is that water resources are abundant, but highly variable and unpredictable over seasons and years. The win-win solution for this type of water scarcity is, obviously, to increase the pie for all, by mobilizing financial, institutional and technical resources to harness the abundance of water resources for development. In agrarian countries, where smallholder agriculture constitutes the engine of economic growth, improved water management should, above all, increase water demand by small-scale farmers and livestock keepers for higher productivity of water that would otherwise flow unused into the sea. User payments need to be mobilized for accelerated water development for their own use.

This paper concludes in section six by recommending how the newly introduced water rights system can keep its strengths as a formal system among urban and rural large-scale water users, while ensuring the emancipation and inclusion of rural small-scale water users in a non-dichotomous property rights system. It is rational to continue taxation at low transaction costs among the few large-scale users who derive the most significant benefits from government water management services. However, among small-scale users, taxation aggravates poverty—it is too costly and logistically unfeasible, and generates new water conflicts. Therefore, taxation should be abolished immediately and phased-in only once the required accountable institutional requirements are in place. Determining the dichotomy in type of rights and payment obligations by setting the thresholds of what is ‘small-scale’, ‘poor’, and ‘basic health and income needs’ should, above all, be guided by realism with regard to the costly logistics of registration and taxation.

For a pro-poor water management tool, it is recommended to maintain one nation-wide formal water rights system in order to avoid a legal dichotomy. However, linkages between water rights and obligations (payment and registration) need to be reconsidered profoundly. Allocation of rights should start by not only recognizing the legitimacy but also legally protecting poor rural people’s water use for productive uses to satisfy basic income needs. It should vest formal priority rights for small-scale productive uses vis-à-vis large users, without any unrealistic obligation to register. Such legal protection empowers the poor in any conflict with the urban and rural large-scale water users. For realizing those rights, the new multi-tiered water management institutions should represent level playing fields. For solving localized, intra-community conflicts, any effective customary and new locally invented legal, institutional and technical arrangements should be encouraged instead of being replaced by a system that aggravates typical upstream-downstream and other water conflicts. Last but not least, more important than spending scarce human and financial resources on administrative and legal tools to share a limited pie, is mobilizing the scarce resources of users and the government to increase the pie to all for expanded water use by harnessing the abundant water resources and rendering otherwise unused water, productive.

2. Legal Dichotomies

2.1 National Context: Economic Water Scarcity

Tanzania is an agrarian country, which ranks 151 out of 173 on the Human Development Index (UNDP 2002). Eighty percent of its 34 million inhabitants live in rural areas, where agriculture constitutes their primary economic mainstay. Agriculture contributes 48 percent to the GNP. Only 6.3 million hectares (15 percent of the total arable land) is under rainfed and irrigated cultivation. The coastal and highland areas receive well over 1,000 mm of rainfall per year and most parts of the drier interior receive less than 600 mm. Physical water resources are abundant, with an estimated 50 percent of all annual surface run-off flowing unused into the Indian Ocean and the large lakes (URT 2002). However, Tanzania lacks the economic resources to harness water and to overcome the extreme temporal and spatial variability in rainfall and surface flow. It is estimated that there are 2.3 million, 4.8 million and 22.3 million hectares of high, medium and low irrigation potential areas in the country respectively. However, currently, the total area under irrigation is only 191,900 ha, out of which 122,200 ha (64 percent) fall under traditional irrigation schemes (JICA/MAFS 2003). The remaining 36 percent are large centrally-managed irrigation schemes, owned by public and private institutions, primarily for sugar cane, rice, and tea. More than 60 percent of energy produced in the country is from hydropower plants located in the Rufiji and Pangani basins, downstream of smallholder irrigators. Other economic sectors that depend on water resources include livestock, forestry, mining, tourism, industry, and fisheries (URT 2002).

2.2 Water Legislation in Tanzania: A Dichotomy

History of formal water rights, registration, and fees

Formal water law was introduced to Tanzania by German and British colonial settlers in the early 1900s. It started with vesting localized water rights in settlers in areas of intensifying agricultural water use, for example around Kilimanjaro. In 1948 water control became nation-wide for the then prevailing boundaries of the colonial state. The colonial powers vested absolute water authority in the colonial rulers by mere declaration. The Water Ordinance of 1948, chapter 257, stipulates in section 4 that “the entire property in water within the Territory is hereby vested in the Governor, in trust for His Majesty as Administering Authority for Tanganyika [...]” After independence in 1961, the new government under Julius Nyerere continued this principle, declaring that “all water in Tanganyika is vested in the United Republic” under the Water Utilization (Control and Regulation) Act 1974, section 8.

This ministerial water authority has increasingly been delegated from the top to the lower tiers of Water Officers and water management institutions. Since the Water Ordinance of 1959, the Minister appoints a national Water Officer, who is vested with the almost absolute authority to make decisions regarding the allocation and changes of water rights. This national function was gradually further devolved to regional, basin, and sub-basin levels. The Water Ordinance of 1959 and the Water Utilization (Control and Regulation) Act of 1974 mention regional officers, besides the national Principal Water Officer, all to be appointed by the Minister. From 1981 onwards, basin boundaries have been introduced to gradually replace the regions as the first tier below national level. In the Pangani basin a Water Office was opened in 1991, supported by NORAD. In the Rufiji

basin, a Water Office was started in 1993 with government funds. These two basins were selected because of their importance for the nation's hydropower generation.

A key task of the central Principal Water Officer and his delegates at regional or basin level is to assess whether new entrants applying for a right are welcome or not to the approval of new water right applications, with or without attached conditions. For a long time, Water Officers had almost absolute powers. Also, up till 1997, a Water Officer had only to 'consider', but was 'not bound to follow the advice'¹ of regional and later basin-level, government-appointed (Advisory) Water Boards. However, from 1997 onwards, the Water Officer was obliged to inform and consider the corresponding Water Board [Water Utilization (General) Regulations of 1997].² Also since 1997, members of the Central and Basin Water Boards were to be drawn from public, private, NGO, and women's Organizations, instead of exclusively from governmental bodies. The National Water Policy of 2002 expresses the intention to further devolve authority for water rights allocation to Basin Water sub-Offices at so-called 'catchment' level or even to local WUAs (URT 2002), but this has not been implemented as yet.

The vesting of centralized legal control over water in the colonial minority rulers and, since 1961, in the independent government, was accompanied by a registration system of administrative water licenses, permits, titles or rights issued by the governmental water authority of the era. Registration to obtain a paper water right was already practiced under German law, and then stipulated in the Water Ordinance of 1923 and every revision thereafter. With each subsequent legal revision, registered rights under any former Water Ordinance were continued in one form or another. Besides white farmers since the early colonization, water users later seeking registration included large-scale governmental and often foreign private irrigated farms and forestry estates, and the Tanzanian Electricity Supply Company (TANESCO). Urban water supply was also protected under other, specific legislation. Thus, 'water rights' strengthened the claims of large-scale rural and urban governmental and private enterprises of a predominantly colonial rural and later urbanizing formal economy.

This water rights system was never intended to become a basis for taxation. The paper water right usually mentions the purpose of water use and conditions, if any, attached to the right such as water quality or obligatory return flows. The assessment of any volume of water allocated was typically the Water Officer's best subjective guess of an average annual volume. This largely fulfilled the purpose of registration, while avoiding high expenditure on measuring devices to define volumes more accurately. The colonial and post-colonial governments also formally ascribed to themselves the mandate to make new regulations, including the authority to "prescribe the fees payable in respect of any application or other proceeding under this Ordinance" since the Water Ordinances chapter 257 of 1948 [35 (d)]. This was reproduced in the Water Ordinance of 1959 (38-2b), and the Water Utilization (Control and Regulation) Act of 1974 (38-2). However, until the early 1990s, fees for registration were absent or nominal and they were only charged at the moment of registration in order to cover some of the administrative costs. No other fees were applied.

Naming the certificate 'water right' is also misleading. While titleholders may expect effective protection, Water Officers have limited means to do more for titleholders than regulating new

¹Water Ordinances 1959 5-(4); Water Utilization (Control and Regulation) Act 1974 6-(2).

²From 1997 onwards, through the Water Utilization (General) Regulations of 1997, the obligation to check comments about new entrants among those affected was further formalized, e.g., by stipulating that the Water Officer has to announce new applications through the Gazette, by notifying those who may be affected and those who are nominated in the Water Boards, and through announcements at the District Commissioner's office. This law also harmonized criteria and registration by promulgating uniform water rights application forms, which specify the purpose of water use and also the volumes allocated (not the volumes used) and annual or, if further detailed, half-yearly averages.

entrants, stipulating conditions to be attached to certain water rights, and perhaps mediating in water conflicts. The law stipulates that “nothing in any such water right shall be deemed to imply and guarantee that the quantity of water therein referred to is or will be available” (Water Ordinance 1959, 16-4; Water Utilization (Control and Regulation) Act 1974: 15-4). Instead of protecting, Water Officers have the formal power to curtail excessive water abstractions by titleholders and manage water scarcity situations.

In sum, for a long period, this water right system remained a rather dormant administrative measure, with few tangible implications for the few relatively water users of the large-scale rural and urban economies who registered. Yet, it was significant for them that they could declare their own new and expanding water uses as legal and legitimate, creating the implicit dichotomy with all (potential) water users who failed to adhere to the system.

History of informal and customary rights

In the colonial era, small-scale rural water use which was invariably under the customary authority of the tribal chiefs, retained a legal status, albeit a secondary status with specific conditions. Sections 3 and 5 of the Water Ordinance of 1948, chapter 257, recognize earlier rights including those “under the 1923 Water Ordinance, lawful mining operations, some claims under the Indian Limitation Act, and native law and custom.” For the latter, however, only the ‘duly authorized representative’ of natives is recognized [section 13 (9)]. Moreover, under some conditions, natives are only recognized “in addition to the District Commissioner” [section 33 (9)].

Even this secondary status was further eroded in later years in particular through the further introduction of registration for water rights by all those who “divert, dam, store, abstract and use” water. Unlike the Water Ordinance of 1948 (section 7), the Water Ordinance of 1959 (sections 11, 12 and 14) opened the option of registration to include native water users, leaving the legal status of those who did not register their water use somewhat undetermined. However, the Water Ordinance (Control and Regulation) Act No. 42 of 1974 (section 14) not only ignored any existence of customary water law, but also stipulated that registration for a right was the only way for any Tanzanian to ensure that his or her water use was considered legitimate in the formal law (Maganga et al. 2003). This measure was undoubtedly guided by the genuine intention of the young socialist democracy to treat all Tanzanians as equals and by optimism about the ease and usefulness of the registration of all. However, it also implied that from 1974 onwards, any de facto unregistered customary small-scale water use would be declared de jure illegal. The legal system of the few ‘modern’ large-scale users was imposed on the large majority of mostly illiterate rural ‘traditional’ small-scale water users who were ignorant of the new law. Strictly speaking, existing customary water use became susceptible to legal prosecution. In practice though, many water professionals in Tanzania acknowledge that nobody was really serious about effectively implementing this formal water rights system. This may reflect a silent consensus, at least up till the early 1990s, that the existing dichotomy between ‘large-scale modern’ and ‘small-scale rural-traditional’ cannot simply be overcome by superimposing an alien legal system on customary arrangements.

2.3 Legal Reform in the 1990s

Introduction of blanket taxation

From the early 1990s onwards, water policies and legal frameworks changed dramatically, intensifying the pressure to impose one formal blanket system on all Tanzanian water users. In

1994 the Subsidiary Legislation [Government Notice No. 347 of 1994 under section 38(2) of the Water Utilization (Control and Regulation) Act No. 42 of 1974] was promulgated. Through this new piece of law, the dormant power to charge fees was revived by introducing a fixed once-off payment for registration of US\$40, plus so-called ‘economic water users fees’. The annual economic water user fee is proportionate to annual volumes of water allocated [in absolute volumes (m³) or flows (L/s)] and depended upon its use. Three years later, in the Water Utilization (General) Regulations of 1997, a Schedule of Fees for much higher amounts was promulgated. The tariffs were slightly revised in the Water Utilization (General) (Amendment) Regulations, 2002 (see annex one). The main difference with the list of tariffs of 1997 was that for small uses below 3.7 L/s, charges were not volume-based anymore. Instead, a flat rate of US\$35 per year was applied, irrespective of the actual volume used. The motive for this decision was, again, the aim to have one uniform legal system for all. The majority of water users in Tanzania fell under this category and “one cannot exempt a majority from taxation” (senior water manager, personal communication). A flat rate would increase tax collected and avoid the hassle for the Water Officers of setting rates for lower amounts than the minimum flat rate—but at the expense of the small users who now have to pay disproportionate amounts.

As already mentioned above, this radical shift coincided with many similar measures of cost-recovery in other spheres of life in that period under the structural adjustment and privatization programs of the late 1980s and early 1990s. Similarly, operation and maintenance costs of irrigation schemes were transferred to the irrigators, although investments in capital costs are still seen as at least a partial government responsibility.

Assumptions underlying the reform: From water development to water regulation

A driving force behind this sudden transformation of a dormant administrative system for a few large-scale water users into a blanket water taxation system was the Rapid Water Resources Assessment in 1994/1995 supported by the World Bank and DANIDA (URT/MOW 1995). Findings of this mission were used as inputs into the formulation of the subsequent River Basin Management and Smallholder Irrigation Improvement Project (RBM SIIP) that started in 1996 with a loan from the World Bank. The design and pilot testing of the legal reform under the RBM component was implemented by the Ministry of Water and Livestock Development.³ The assumptions underlying the RBM component were also reflected in the new National Water Policy (2002). The drafting of this policy (and currently of the new water legislation) was largely funded by the same project.

³The River Basin Management Component “would fund interventions designed to improve water management both at a national level and in the two target basins. Activities to be funded include:

- (i) strengthening national water resources management by reforming the regulatory framework to improve stakeholder participation in basin management, strengthen the water rights concepts and management, increasing penalties and raising fees for water use and improving information gathering and analytical capabilities at the national level
- (ii) improving both the regulatory capabilities and the information and resource monitoring capabilities at the basin offices in Rufiji and Pangani, and
- (iii) rehabilitating the hydrometric network in the Rufiji and Pangani basins” (World Bank 1996 section 2.8).

The loan disbursed for the River Basin Management and Smallholder Irrigation Improvement Component to the Tanzanian Treasury under the Development Credit Agreement amounts to 18.2 million Special Drawing Rates (equivalent to US\$26.3 million) to be reimbursed within 30 years after the first payment, due in October 2006. Till 2016 the interest rate is 1 percent and after that, 2 percent. The River Basin Management component comprised slightly more than US\$10 million. The latter was to support the national Water Resource Department and office of the principal Water Officer through specialized equipment, vehicles, training, and technical assistance. The two basin offices were to be provided with equipment, training and technical assistance (section 2.18). After project closure in 2004, part of these costs is to be borne by the basin inhabitants.

The diagnosis of both the mission report of 1995 and the RBM Staff Appraisal Report (1996) was that there was an urgent need to shift away from the water development agenda of the National Water Policy of 1991, which the government of Tanzania had just adopted.⁴ Instead, a regulatory agenda was needed, especially in the Pangani and Rufiji basins. “In both these basins there are serious user conflicts, deterioration of resources due to misuse and lack of comprehensive planning and management mechanisms” (URT 1995). In the Rufiji, upstream water use was believed to have reduced electricity delivery by the Mtera–Kidatu power plants, which caused electricity rationing in Dar-es-Salaam in 1993. Hence, “a framework is needed for preventing and resolving conflicts among competing users and for regulating demand. The conflicts surrounding the inflow and use of water in the Mtera Reservoir crystallize the issue. With (...) an emphasis on drainage of wetlands so land can be used productively and other water development and flood control structures, the 1991 National Water Policy may result in actions which further degrade environmental quality in Tanzania. The Bank and the Government would collaborate on the refinement of the National Water Policy under the project” (World Bank 1996 section 1.27). “The conflict in the demand for water can only be resolved through more transparent, structured allocation and control mechanisms for basin water resources” (World Bank 1996 section 2.1).

Taxation ‘to recover costs and deter water use’

The solution to this growing competition over water proposed in the RBM project was to further increase the “economic water users fees” that had been introduced in 1994 and “which it is recommended be redefined as a tax on water use assessed to cover the costs of operation and maintenance of basin monitoring and regulatory facilities” (World Bank 1996). According to the Staff Appraisal Report, the key weakness of the existing law had been that neither the basin level “economic users fees” nor the charges for delivery of water cover the true cost of the resource. According to the report, this caused two problems. “In both the water supply sector as well as in irrigation, insufficient revenues are generated to cover operation and maintenance costs. The quality of the service and of the water received is undermined. A second problem is that the low tariffs encourage inefficient use of water and waste by industry, consumers, and irrigators” (World Bank 1996 section 1.28).

Taxation was expected to solve these two problems at the same time. First, taxation would enable self-financing of basin and catchment Water Offices and Water Boards. “With regard to the ‘economic water users fees’ to be collected by basin Water Officers, it is proposed under this project that these rates be raised to a level which would provide sufficient funds to support the administration of basin water offices, including the collection of information on water quality and availability, the enforcement of pollution standards, and the administration and monitoring of water rights.” Functions of Basin Water Boards encompass “the issuing of water rights and registration, regulation and enforcement, but also water resources exploration, assessment, pollution control, monitoring and evaluation, environmental protection, basin planning and development and other cross-sectoral activities (...)” (URT 2002: 50).

Second, taxation was expected to contribute to managing water as an economic good. Volume-based taxation would represent “the allocation of water as a public good and as an economic good

⁴The government’s endorsement of the policy shift from development to regulation so quickly after 1991, was due to a loan condition of the RBM project, as reflected in Annex A of the Project Staff Appraisal Report of 1996, in which the Minister for Finance formulates a new Statement of Water Resources Management Policy.

with a value in all its competing uses and the use of a water user fee as a means of encouraging efficient use of the resource and for meeting the cost of regulatory functions” .The National Water Policy expresses the same expectations of taxation. ‘Economic instruments include water pricing, charges, penalties and incentives to be used to stimulate marketing mechanisms, and serve as an incentive to conserve water, and reduce pollution of water sources’ (URT 2002: 7). Further, “decision-making in the public sector, private sector and in civil society on the use of water should reflect the scarcity value of water, water pricing, cost sharing, and other incentives for promoting the rational use of water” (URT 2002: 21). “Economically, trading of water rights, application of economic incentives and pricing for water use, shall be gradually built into the management system as a means or strategy for demand management and water conservation” (URT 2002: 30).

The practical implementation of this argument— “enhancement of water fees and pollution charges as an incentive for water conservation and pollution control, and as a source of funds for water regulation activities, catchment conservation, and water resources monitoring” (World Bank 1996 annex A)—would be via the Water Officers. “The basin water offices will be mandated to collect revenue such as fees and charges and to be used to meet the cost of regulatory functions and financing of water resources assessment services. The minister of Finance has already authorized the basin Water Officers to collect user fees and operate a bank account for the use of such funds. The basin water offices and basin water boards will be required to account for the use of these funds, which will also be audited annually by Government auditors as is occurring with other public funds” (World Bank 1996, annex A).

Thus, by 1996, “plans were in effect to progressively increase water tariffs throughout Tanzania and to be continued under the present project” (World Bank 1996 section 1.29), and “it was agreed that Government will, by December 1996, revise existing regulations so as to increase the water user fee to a level sufficient to cover operating costs of the river basin offices” (World Bank 1996 section 2.17). These plans were effectively implemented in legislation through the above-mentioned schedules in the Water Utilization (General) Regulations of 1997 and its amendment of 2002, and also in the National Water Policy which seeks to “ensure financial sustainability and autonomy of Basin Water Boards” (URT 2002: 26) especially by charging water use for productive purposes (URT 2002: 50).

The water use registration system as basis for taxation and water management

The existing water rights and registration system was seen as a good and readily available basis for taxation and regulation. It was expected to perform well; it just needed to be implemented. “The conceptual framework for integrated river basin management is already laid out in the 1974 Act, as amended in 1981. However, the legislation has never been effectively implemented. The Government has submitted a letter of Water Resources Management Policy outlining measures to be taken to update the legislation and improve management of this resource” (World Bank 1996 section 2.13).

The expectations regarding the effectiveness of the registration system as a water regulation tool were also high: “The administrative system, centralizing information for the river basin, should: (i) be in a position to control withdrawals of surface and groundwater by issuing and revoking water rights; and (ii) know at all the times the quantity of water available in the basin, and its use, by monitoring both the sum of water rights granted, and physical availability” (World Bank 1996 section 2.24). Similar optimism about the existing water registration system as an effective tool to curtail water use was expressed in the National Water Policy of 2002. The key legal instruments to be adopted would “include restrictions and all prohibitions imposed by the regulatory body and the Government. These are individual licenses for abstractions and their revisions” (URT 2002: 7).

Yet, some problems in implementing the new legal framework were anticipated. It was recognized that “water rights applications required a fairly lengthy procedure” (World Bank 1996 section 1.24) and that “data on precipitation, hydrometric data and actual abstractions for irrigation is inaccurate and sketchy” (World Bank section 1.25). Almost one decade later, the problem is still serious. “Currently the data collection networks are in a state of near total collapse due to lack of adequate resources and tools” (URT 2002: 35).

Problems of registering, taxing, and managing many scattered small-scale water users under customary water management arrangements were also foreseen. Three possible solutions were mentioned. First, long-term government measures would include “encouraging smallholders to form groups, especially smallholder farmers, which will make it easier to collect the fee from the groups, rather than from individual users” (World Bank 1996 annex A). Second, a review of the institutional framework was foreseen that would address “the strengthening of the water right concept by: (i) clarifying how the vesting of all water in the State, with the Government sanctioning all uses, affects customary water rights, exercised by riparians or livestock owners or other traditional users, who have not sought, nor been given water rights under the law; (ii) clarifying the cases in which the State is entitled to modify or withdraw this water right (now very broadly defined, and permitted whenever water is required for a public purpose).” (World Bank 1996 section 2.15). A third solution was to introduce taxation in a phased manner. “The actual user fee will be levied first on economic activities such as hydro-power production, and large farms, followed by levies on smallholder farmers. The related fees will gradually be built into the management system that touches all users with the ultimate objective of promoting conservation and minimizing abuses” (World Bank 1996 annex A). As mentioned above, the Water Utilization (General) (Amendment) Regulations of 2002 suggest that, at least on paper, the last stage has been achieved, with all water users included.

“At the start, we thought it would be easy” commented a senior Tanzanian staff member of the River Basin Management Project in 2003. The findings of the factual implementation of the new water rights and fees system in the Upper Ruaha catchment demonstrate that none of the above-mentioned assumptions are valid with regard to small-scale water users in that area, and most probably elsewhere in Tanzania. Even among the few large-scale water users, some of the outcomes were unexpected and disappointing.

2.4 Context of the Pilot Area: The Upper Ruaha Catchment

The Upper Ruaha catchment covers an area of 21,500 km² and forms the headwaters of the Great Ruaha River—itsself forming a major sub-basin of the Rufiji River. The catchment may be broadly divided into a surrounding high escarpment, the lower slopes, and a central plain, also named the Usangu Plains. The plain receives 600-800 mm average annual rainfall with a rainfall gradient of 1,500 mm on the high escarpment. There are five perennial rivers and a large number of seasonal streams draining from the escarpment. Most of the rain falls in one season, from mid-November to May, leading to run-off flooding. The dry season is from June to November.

The population which stood at 1.3 million in 1996 in this area has grown extremely rapidly, mainly because of a continuous influx of migrants. By 1990, 55 percent of the population consisted of migrants from at least 20 different ethnic groups—especially cultivators from the southern highlands. In-migrating livestock herders from central and northern Tanzania constituted 18 percent of the population, and today they own the majority of herds in the area. They are concentrated in the downstream plains (SMUWC 2000, 2001). The number of livestock keepers has continued to increase since the closure of the wetland at the lowest sink in the plains in 2002, which further

increased pressure on land and water resources. While the clans of settler-cultivators located upstream have kept their social structures somewhat intact in spite of Ujamaa villagization and growing influence of local governments, the social cohesion among dispersed communities in the downstream plains is weaker.

Since the early twentieth century, the original settler societies and the in-migrating cultivators started taking up irrigated agriculture in both the wet (paddy) and dry seasons (paddy and other crops) by abstracting water from the many surface flows. By blocking the streams with seasonal weirs of wood and grasses ('dindilos'), water is scooped into earthen diversion canals (Lankford 2004). In the last two decades, external support was provided to replace some of these seasonal structures with permanent concrete structures. This saved the communities the recurrent efforts of rebuilding the seasonal weirs after the floods had washed them away. Theoretically, the new structures also allowed better regulation of the one portion of the stream that flows into the diversion canals and the other portion that remains in the flow for further use downstream. In total, there are an estimated 120 off-take structures along a stretch of about 50 km, 70 of which are in the Mkoji catchment. Two thirds of the intakes were constructed after 1970 (SMUWC 2000).

In the 1980s, three state-owned large rice schemes were initiated for smallholder cultivation at the lowest slopes: Kapunga (3,000 ha), Mbarali (3,200 ha), and Madibira (3,000 ha). Valley bottoms were also cultivated. Recently, demand for irrigated land and water has been triggered further by favourable markets for irrigated crops. While prices for the original non-irrigated crops such as coffee and pyrethrum fell, prices and markets for irrigated vegetables and maize improved. Currently, the total irrigated area ranges from between 20,000 and 40,000 ha depending on the annual rainfall. Most irrigated land is farmer-managed.

Farmers' irrigation development has been accompanied by the creation of robust customary water management institutions at scheme level. Intricate arrangements govern the construction and maintenance of dindilos and diversion canals, and water distribution within the local schemes and to some extent also between schemes along stretches of the common streams. Among the customary principles that contribute to the efficacy of local water governance are: water rights based on labor contributions, rotational water allocation within a scheme and some forms of rotation among upstream and downstream schemes, consensus building and conflict resolution before escalation, special consideration for the weakest community members, and peer control with low-transaction costs (Maganga 1998; Sokile and Van Koppen 2003).

However, in the past 2 to 3 decades, the rapid growth in water abstraction in the upper catchment has increasingly deprived the downstream areas of the dry season flows they used to have in abundance in the past. Downstream dindilos and schemes have been abandoned for this reason, while former perennial flows now dry up for 4 or more weeks in the dry season. Initially, village elders from the downstream areas organized official delegations to upstream communities, but without much effect. When the elders stopped, no new collective measures were undertaken (Video, 'Talking about Usangu' 2001). Individual solutions continued. For example downstream farmers increasingly started to rent irrigable land in upstream farmer-managed irrigated areas. However, recently, initiatives for collective and institutional responses have emerged again, like the testing of a 'River Basin Game', developed by RIPARWIN (Lankford and Sokile, 2003). Village debates stimulated by this tool will raise awareness about downstream deprivation and solicit options for remedies. Remedies include further water use curtailment by upstream users, but also the option of further storage construction to hold floods during the rainy season for use during the dry weeks. An example is the proposal for a small dam in the Ndembera River in the Upper Ruaha catchment, which was shelved for many years when discourse focused on regulation, but is now being considered

again. This dam would provide the flow that the downstream Ruaha National Park considers as being minimally required during the dry season for wildlife.

Significantly, the water scarcity problem of the further downstream Mtera and Kidatu hydropower plants that occurred during the nineties was found to have no relationship with the drying up of the Great Ruaha during the dry season (Machibya et al 2003; Yawson et al 2003), although with the continued growth of irrigation the link between wet season abstraction and recharge may now start and increase. Instead, it was acknowledged that the reduced electricity production in 1993 had been caused by deviating from the originally designed management arrangements of dam storage within the stretch between Mtera and Kidatu.⁵ Hence, the remaining sections exclude the hydropower plants as stakeholders in the upstream-downstream conflicts in the Upper Ruaha catchment.

3. Registration Tool: Cadastre Disaster

Partially available data: Names and uses

According to the database in the Rufiji Basin Water Office in Iringa, by mid-2003 the government had issued 990 water rights in the entire Rufiji basin, with 40 percent held by governmental agencies, 12 percent by Brooke Bond Tea Company, and 8 percent by various Catholic dioceses. The remaining 40 percent of registered users include private irrigation schemes, such as those belonging to Baluchistani and other Asian immigrants who were brought by the British colonialists.

Fourteen percent of all water rights were issued between 1955 and 1960. The number steadily increased over the years. From 1995 onwards, registration intensified with 29 percent of the rights administered under the new Rufiji Basin Office, though these are largely still in the stage of application or with a provisional status. The right-holders utilize water mostly for domestic purposes, followed by irrigation, but often also in combination. Livestock is sometimes explicitly mentioned, and sometimes considered under domestic purposes. Water rights for hydro-power constitute 3 percent of rights, while industrial use is only 2 percent. The cadastre of the Rufiji basin also stipulates the status of the water right, which includes those who abandoned the use of their water right. As many as 47 percent of the registered rights are not operated anymore. The proportion is highest for the oldest rights, but even in the most recent applications, abandonment of the water right occurs.

In the Upper Ruaha catchment alone, 100 water rights have been issued, including water rights for individual farmers and farmers organized in Water User Associations. Slightly more than half (56) of the water rights are in the Mkoji sub-catchment, and were issued mainly for irrigation purposes. Most rights in this sub-catchment, especially those among smallholders, were issued in the late 1990s or more recently under the River Basin Management project, especially since the

⁵While upstream water abstractions by irrigators during the dry season in at least part of the Upper Ruaha and Usangu plains were confirmed to affect the dry-season flows in the Ruaha National Park, the water scarcity and electricity generation problems of the mutually related Mtera and Kidatu plants appeared to be due to a local problem of water storage management for these twin reservoirs and, at least up till now, *not* related to water use further upstream. The upstream physically well-situated larger Kidatu reservoir is meant to both generate some electricity *and* provide water during the dry season to the smaller water reservoir of the more important downstream Mtera plant. However, in 1993 water of the Kidatu reservoir had been used quite extensively for electricity generation, and more rain was expected to fill the dam sufficiently. However, when the drought persisted, the upstream reservoir could not provide sufficient water anymore to the downstream plant during the dry season, leading to the often cited electricity rationing in Dar-es-Salaam in 1993.

opening of the Rufiji Basin Water sub-office for the Upper Ruaha catchment in Rujewa, Mbarali District, in 2001 (Sokile 2003). Requests for water rights in the catchment are first processed in this catchment sub-office, before being brought to Iringa, 300 km away, for final approval by the Basin Water Officer and incorporation in the register.

An inventory of the 990 names of the individual or collective water users, their main uses and the operational status of the right are an obvious first step for any cadastre. However, in spite of the considerable efforts to trace the abandonment of water rights by people who have died or moved out of the region, there are bound to be other cases not notified. Many more actual water users have not even been identified. This gap is currently being assessed. Recently, an inventory of unregistered water users in the Rufiji basin was conducted, which estimated unregistered users at 573, more than half of the registered users (Msuya 2003).

Estimates: Sites

Information about the sites where water is used is only documented in the register by the mentioning of names of the larger streams and the nearby villages and wards. There are no detailed maps, coordinates, or map references to provide more precise information attached to the cadastre. This lack of clarity of the sites of 'water rights' has aggravated rather than solved water disputes in the area (Maganga et al. 2003).

Lack of data: Volumes

The current register has figures for annual volumes in only 28 percent of the rights registered. However, even for this portion, the variation in annual volumes allocated shows that mistakes have been made, for example, in registering and entering the place of the commas and the number of decimals. As yet, there is hardly any registration of half-yearly average volumes, differentiating the rainy and dry seasons.

The current lack of reliable data on volumes of water allocated, let alone volumes of water used, especially by individual small-scale traditional irrigators during different periods of the season, is inevitable. The high seasonal and annual variability of run-off, streams, and water abstracted and the general lack of any measuring devices, renders any estimate a subjective guess. Even if the few permanently constructed intakes that divert water from the streams were fully operated according to their technical design, which is never the case, fluctuations of abstractions during flooding and dry spells cannot be captured in half-yearly and yearly average abstractions. Moreover, water needs and abstractions also vary with the quantities of direct rainfall on farmers' land, evaporation rates, cropping patterns, changes from grazing land to cropland, etc. Return flows are equally variable.

Modeling the water demand on the basis of proxy information such as command area and crop water requirements is also highly problematic even if these variables were sufficiently known and stable over time. Thus, even the most sensitive hydrological models, estimates based on crop water requirements, or newly designed abstraction structures can only generate rough estimates for aggregated annual uses in major streams, and certainly not for each individual along such streams, especially in the dry weeks. Given the persistent lack of costly flow monitoring devices in Tanzania, even such aggregate hydrological figures are rare. Therefore, for decades to come, there will be no grounds for the assumption that the administrative system would "know at all the times the quantity of water available in the basin, and its use, by monitoring both the sum of water rights granted, and physical availability" (World Bank 1996).

Costs of maintaining cadastres

While the current MS Excel files of the water register only include names of some of the water users and approximate streams or communities where they are located, the costs of maintaining even this simple system in rural Tanzania are much higher than in most other places in the world. This is due to a combination of factors, including the generally low levels of literacy among small-scale users, the huge distance to many scattered hamlets, bad roads especially in the rainy seasons, expensive vehicles and fuel, the lack of facilities to phone, email or write to water users, and minimal computer and software facilities. The costs of compiling and maintaining an administrative cadastre may be justified when it only concerns a few large users. However, among all water users in a basin, costs even of just noting the names of users are extremely high compared to the benefits. These conditions resemble what Bruns and Meinzen-Dick (2003) call the ‘cadastre disaster’. Even for land tenure cadastres in developing countries, the incentive to maintain and update them after their costly establishment is often disappointingly low. The registration and systematic update of quantitative water allocations, which cannot be measured at any reasonable costs in environments without significant water control, are certainly administrative disasters.

4. Taxation Tool: Corruption by Design and Financial Losses

4.1 Corruption by Design

Administrative water rights may have served some purpose for water legislation among a few large-scale users before the 1990s, but insurmountable problems arose as soon as this administrative system became the foundation for volume-based blanket taxation among all. The lack of objectivity and transparent procedures incorporates ‘corruption by design’ into the new system of water rights and fees in at least four ways: in rate setting, enforcement; handling of public funds, and distortions in collective water rights and payment. Even the most corruption-proof officer is vulnerable—he lacks any objective defence against accusations of corruption.

Arbitrary rate setting

Volume-based rate setting may seem objective and fair. However, in the absence of any objective basis to assess the volumes allocated and, thus, to set volume-based rates, Water Officers can only rely on their subjective judgement. Even the setting of nominal differences by ranking structures according to their sizes appeared difficult. In the Mkoji sub-catchment, for example, the volumes and related fees for the larger structure of Inyala A were initially set at lower rates than for a nearby smaller structure of Inyala B. The water users complained. In this case, the Water Officer accepted the complaints and changed the fees the other way around. In other cases there was enormous confusion among small and medium-scale users in the Upper Ruaha about the amounts to be paid (Sokile 2003; Gausson 2003).

The recently introduced threshold below which a flat rate has to be paid may solve the problem of rate setting, but it hits the smallest, often poorest, users hardest. Punishing small water users by charging disproportionately high rates because of administrative problems is difficult to justify on social grounds and, once they have paid, would certainly fully justify that they start using much more water. In fact, among private larger water users, rates were effectively set following negotiations with

the Water Officers and payment followed promptly (Sokile 2003). So willingness and ability to pay, rather than hypothetical water volumes, emerged as the basis for rate setting among large users.

Weak and arbitrary enforcement

Enforcement of registration and payment is almost impossible given the limited staff on the ground, and costly because of the time and transport costs of repetitive reminders. Although especially the least powerful are intimidated by the threat that they will be brought to court if they refuse to register and pay, effectuating such a threat is not a realistic option. Similarly, the common threat to cut access to water in case of non-payment can hardly be implemented in reality. The huge time inputs and transport costs are one reason. The other reason is that there are hardly any sluices, gates or other water control structures that the Water Officer can operate. And even if he locked any of the few improved intake structures, farmers would break them as soon as he left the village.

Enforcement of payment appears most difficult vis-à-vis other government agencies. In the Mbarali and Kapunga State Farms, for example, the Water Officers do control operational devices. However, the arrears in payment are among the highest, while the cash instalments paid during each trip are typically small. More generally, only 38 percent of the government agencies holding water rights (e.g., local government for domestic supply and state farms) regularly pay fees. The argument ‘why should the government pay the government?’ is used to justify such arbitrary taxation, but jeopardizes the goal of cost-recovery for the functioning of the basin offices. By contrast, 92 percent of private companies/estates, such as Brooke Bond Tea Co. Ltd or Tanzania Wattle Co. Ltd. fulfill their duties (Sokile 2003).

Lack of administrative accountability in handling money

Water Officers at various levels have been mandated to collect and transfer public money. However, accountability procedures in carrying out this task are weak. The Water Officers write receipts for taxes received, but an administrative system that inserts fee payments into the Excel sheet of registered water users is still absent. Further, when submitting the collected funds from the sub-catchment office to the basin office in Iringa, the accountant notes the amounts in the books. A public auditor is supposed to check the various amounts, but, for the moment, the public auditor’s key interest is in the publicly allocated funding from the government, and not parallel funds for basin offices. Without a sound transparent system to administer and justify money flows, the basin and catchment level officers render themselves vulnerable to accusations of corruption.

4.2 Water User Associations as Tax Collectors

As already anticipated in the RBM project Staff Appraisal Report, the obvious response to the high costs for individual registration and fee collection was to promote the formation of new WUAs by irrigating smallholders. As water rights can be either individual or collective, any number of water users sharing a common water source could form a WUA and apply collectively for one water right. The water users would save on individual application fees, while the government would win the most by shifting most transaction costs for fee collection to these local bodies.

More than 43 irrigator WUAs have been formed in the Upper Ruaha catchment (Sokile 2003). However, the rapid ‘organization’ into some form of committee entails the serious risk of evoking elitism and corruption in the leadership. This is even stronger in Tanzania, where forced villagization

and cooperative-building led to notorious forms of corruption and deeply entrenched suspicion about any form of government-imposed cooperation, as also commented in the Upper Ruaha sub-basin (Gausson 2003). Committee leaders have more power than government officials to effectively cut water of those who do not pay their share of the government taxes. They can more easily interfere in the intricate customary irrigation arrangements of which they are a part, or threaten to do so. Organizing irrigators to pay government taxes via accountable or unaccountable village leaders, renders the shared water resources a source of money controlled by a few, instead of existing as a shared resource for all. This new principle of payment for water may seriously distort customary institutions—again hitting the most powerless—the hardest. Moreover, even if farmers are encouraged to form their own organization, the idea of having to pay taxes thereafter would be a clear disincentive with regard to this. Although the WUAs are still too young to study such processes in reality, the risks are real.

4.3 Tax Collection among Small Users: Draining Public Funds

Contrary to expectations, the taxation of small users appears to be a drain of scarce government human and financial resources. Government officials from the lowest to the highest level with whom this issue was discussed admitted that the transaction costs of charging scattered smallholders in farmer-managed irrigation schemes without telephone, email, post office, or bank account facilities are considerably higher than any net revenue gained from this category. A simple calculation illustrates this point. The Water Officer needs to make two or three trips to smallholder areas, one for announcement, one for the collection of fees, and often one trip as a reminder. Even for readily paying small-scale water users at 15 km distance from the sub-basin office, the estimated fuel costs alone, according to government tariffs, are at least $2 \times 2 \times 15 \text{ km} \times \text{US}\$0.75 \text{ per km} = \text{US}\45 while the income collected is typically only US\$35 or 40. However, the distances in the Rufiji basin from the Water Office to the water users are much higher. An estimated average is 87 km (Sokile 2004) from either the Iringa or Rujewa basin offices. So the fuel costs for collecting taxes from small-scale water users typically requiring three trips per year amount, on average, to US\$392. This still excludes the costs of the four-wheel drive vehicle purchase and maintenance, the salaries and per-diem of the Water Officer, driver, and assistants, plus all other administrative costs.

This stands in sharp contrast with the very minimal transaction costs of taxing large users. For example, TANESCO pays an annual Royalty Fee directly to the Ministry by bank transfer. After billing, large users such as Brooke Bond Tea Company, Kilombero Sugar Company, Kilombero Valley Teak Company, District Governments, and the Dioceses normally pay by cheque or bank transfer. For the rare payments in cash, one trip to such large-scale users is usually sufficient. The Rufiji Water Office estimates the average fee from large-scale users at US\$100, three times that of the minimum flat rate (Sokile 2004).

Currently, the annual taxes collected in the Rufiji basin amount to US\$50,000, as estimated by the Basin Office (Sokile 2004). TANESCO's royalty payment of US\$165,500 for the hydropower works in both the Rufiji and Pangani basins stays at national level. Overall expenditures of the Rufiji basin office are estimated at nearly US\$225,000 [see annex two (Sokile 2004)].

In sum, the goal of self-financing the Rufiji basin office has not been achieved at all. The huge implementation costs of taxing scattered small-scale users were insufficiently anticipated during the design of the new water rights and fees system. Promoting WUAs and Water Officers merely as tax collectors is no solution either. Taxation easily suits large-scale water users. But the net tax income received from large users has increasingly been spent on the loss-making activity of taxing small-scale users.

4.4 Lack of Legitimacy

Taxation has met with fierce local opposition among smallholders and livestock keepers in the Upper Ruaha catchment. The well-meant explanations of the Water Officer that money was needed for the vehicles, fuel, construction and office costs of the Rufiji Basin Water Office, were not convincing to the protesters. Their main complaint was that there has been no improvement in services delivered in return for the taxes. Therefore, farmers continued to think that water is given to them, if by anyone, by God, and is made available to them purely due to their own efforts of channeling streams. Given this wide-spread opposition, it was surprising that this protest did not lead to the categorical rejection of the new system. Ironically, the reason for its partial acceptance lay in the new conflicts and divisions that emerged between upstream and downstream users, where the former used the new system to strengthen their own claims to water at the expense of the latter, as described below.

The legitimacy of the new taxation system has also been questioned at national level. In the budget speech of June 2003, the government abandoned the proliferation of rural taxation, realizing that the cost involved in collecting small, rural taxes is often more than the amount these taxes generate, that they tend to discourage economic activity, and often meet with widespread resistance, among others by opposition politicians (Fjeldstad, personal communication). In sharp contrast however, the Ministry of Water and Livestock Development wants to introduce new rural taxes. Moreover, blanket taxation for all ignores, again, that the new taxation system is accepted by only the few 'modern' large-scale users, as manifest in their willingness to pay. It lacks legitimacy among water users whose legitimate claims to water are derived from other, customary legal systems. Any taxation policy should carefully consider and weigh priorities and exemptions and, first of all, establish sound logistical taxation procedures.⁶ Evidently, in the light of Tanzania's general poverty eradication goals, charging up to US\$35 or US\$40 from individual or groups of organized poor people earning one or two dollars a day, is questionable.

4.5 Conclusion

Applying a blanket taxation system to small-scale water users fails to achieve the expected goal of self-financing governmental basin management. Instead, it drains scarce government resources. It threatens government credibility by imposing a corruption-prone system based on the authoritarian powers of basin Water Officers and on the willingness of local 'committee' leaders to take over untransparent fund collection. No service is improved and water taxation is at odds with the general rural taxation policy at national level. Furthermore, the contested system aggravates poverty.

Yet, water management by the government costs money and needs to be financed by public revenue, either via the central government or directly by water users. By including water taxation in the mandate and implementation channels of the Tanzania Revenue Authority, for example, many logistical problems for Water Officers could be avoided. For the direct taxation of water users, legitimacy could be considerably enhanced by applying principles such as: consistency with overall national policies (in which poverty eradication and smallholder agricultural growth figure high), the ability to pay (especially among the few large users who gain by far the highest added value from water), and willingness to pay (as already accepted by non-governmental large users).

⁶For example, in Mexico all irrigated agriculture is exempted from tax payment, also because the simultaneous irrigation management transfer programs already implied considerable extra costs for irrigators (Garduno, personal communication 2003).

Transparency and objectivity in rate setting and accountability in the handling of funds are other conditions for the legitimacy of taxation. Above all, taxation needs to generate net incomes. The phasing-in of taxes that keeps pace with logistical implementation capabilities is a prerequisite.

In sum, taxation for water use fits the modern large-scale rural and urban sectors, but cannot be imposed on rural small-scale users. Small-scale water users should be exempted from any taxation until logistical capabilities are developed and the purposes of taxation are fully accepted. Although the implicit assumption that only those who pay taxes can claim rights to water is rapidly gaining ground, the government should clearly clarify that such a direct connection does not exist: taxation and access to water are separate matters of public choice.

5. Water Management Tool: Increasing Water Use and Inequities

5.1 A Legal Water Management Tool: De Jure and De Facto Failure

The expectations of the RBM project and the National Water Policy (URT 2002) that an administrative water rights and fees system would, by itself, serve as a water management tool and “be in a position to control withdrawals of surface and groundwater by issuing and revoking water rights” (World Bank 1996) were high. Again, the opposite was observed in the Upper Ruaha catchment. The government’s de jure and de facto role in water allocation appeared weak, both among small-scale and large-scale users. Among small users, the new system even contributed to intensified upstream-downstream conflicts.

As already mentioned, the government itself denies any de jure link between water rights and actual availability.⁷ Further, an average annual volume filled on a water certificate has no meaning during the few dry weeks in the year during which the flows, which are to be shared by many, are far below that average. So the new water rights and fees system fails to give Water Officers any legal means of preventing upstream registered water users from using any amount of water they want during the dry season. In the natural environment of the Upper Ruaha catchment and with very few structures to control water, the government has no de facto control over the highly varying water flows, as already explained with regard to the non-option of curtailing access to water to enforce registration and tax payment. These legal and operational limitations are the ‘Achilles heel’ for any water rights system that derives its assumed impacts from actually preventing water users from transgressing upper limits.

5.2 Increased Water Use and More Inequity

Instead of controlling water allocation, the Water Officer was increasingly drawn into the divisive strategies of the upstream water users that reinforced their claims to water vis-à-vis downstream users, which, ironically, they legitimize on the basis of the new water rights and fees system and the notion that water is an economic good. Without a clear idea on the nature of the water scarcity problems and the government’s role in mitigating conflicts, the Water Officer had first issued water

⁷The Water Ordinance 1959, Part IV 16 (4) and its literal repetition in the Water Utilization (Control and Regulation) Act 1974 Part IV 15 (4) stipulate: ‘Nothing in any such water right shall be deemed to imply any guarantee that the quantity of water therein referred to is or will be available’

rights to upstream irrigators who are somewhat wealthier and better-organized. Although complaining, these upstream water users accepted the new regime of registration, payment and organization into WUAs. Compliance to the new government instructions strengthened their water claims vis-à-vis downstream users who had not registered as yet. For example, the irrigators in Inyala village expanded irrigated land by 40 percent. They justified this by explaining that since 2000 they had bought water for US\$100 so they had the right to exploit this precious resource to the maximum, unlike the downstream users who had no water rights. The increased tax-based ‘water security’ is also one of the factors contributing to the doubling of the land value in that village. Significantly, the only apex WUA that has been created, and that is supposed to organize all users along the Mkoji river, has never contacted the downstream users since its inception in early 2003. So contrary to the assumption of the RBM project and National Water Policy of 2002 that payment for water would lead to reduced water use, upstream farmers increased water use in spite of strong protests by downstream users. The new, alien, individualistic notion of ‘water as an economic good’—in the smallholders’ own words “I paid for the water, so I can use it”—rendered upstream users more aggressive than under any customary arrangement.

The Water Officer hardly contacted the livestock keepers and the fragmented in-migrating communities in the plains downstream. Not a single WUA has been established in that area. Yet, by 2003, after two years during which upstream users strengthened their claims that they can continue using water ‘because they paid for it’, some downstream users became so alarmed that they started wanting to become registered, even though they hardly received any water in the dry period. They expected that this would strengthen their bargaining position. However, while the politics of promising support to conflicting water users certainly facilitated the job of the Water Officer of achieving quick registration and tax payments, this ‘gain’ was only temporary. Evidently, registration and tax payment fail to generate any extra water in the zero-sum game of dividing a limited pie during the dry season in the Upper Ruaha catchment. Without extra water, the many taxpayers will soon question the Water Officer about his promises to support their access to water in return for accepting registration and payment for a water right. Significantly, in 2003 the Water Officer of the Upper Ruaha started emphasizing how the water law itself stipulates that the government does not provide any guarantee that issued water rights for which taxes are paid, are actually delivered (Msuya 2003). Realizing the likely repercussions of ‘selling unrealistic expectations’, the Water Officer had to protect himself by emphasizing the disconnection between tax payment and water availability. Moreover, the Water Officers recently stopped issuing water rights altogether. They now give priority to the mere inventory and registration of all users.

In the near future, the government will have to develop a vision on the role of the Water Officer, the local government, and the small-scale water users in addressing upstream-downstream conflicts. Capitalizing on any local conflict mitigation arrangement that already exists under customary norms or is further developed is one way forward. The government’s role could include setting the minimum broader frameworks of water sharing within a supra-local context while leaving the local specifications to those who have to implement it setting generally agreed principles in the public interest; and playing a facilitating role to catalyze effective forums, starting with downstream and otherwise disadvantaged users. Water distribution principles and infrastructure should accommodate the highly varying water quantities. For example, by exploring the merits of proportional distribution of water flows, rather than on allocating fixed volumes. Proportional allocation is easier to design and more transparent to monitor and enforce. Ensuring that all get water implies that the government should protect those who risk being the losers in accessing water.

5.3 The Better Alternative: Increasing the Pie

The root of the problems that the RBM project is facing is that it has confined itself to the most difficult one of two alternatives: trying to share a limited pie, instead of increasing the pie for all. The solution to the problem of water demands exceeding water supplies in the National Water Policy of 1991 and everywhere else in the world, throughout history, has been to expand water storage and capture the floods during the rainy season for use during the dry season. Such higher productive use would also generate income from which users will be able to finance their contribution to the investments, and would be willing to do so—even the poorest.

6. Conclusions and Recommendations: Unifying Dichotomous Water Laws for Poverty Alleviation, Conflict Mitigation, and Cost-recovery

With the pilot implementation of the new water rights and fees system, it was discovered that, among the few large-scale users, the aim of generating net income for at least the partial self-financing of basin-level water management institutions was reached, but the aim of reducing water use for public interest was not achieved. However, among small-scale water users who for decades, if not centuries, developed and managed water according to their own customary principles, the new system appears counterproductive in all respects. The key lesson is that ‘modern’ legislation cannot be imposed in rural settings of small-scale water use. The existing dichotomy of Tanzania’s socio-economic spheres and legal systems cannot be ignored. Therefore, instead of trying to replace a customary legal system with another ‘modern’ one, it is recommended to develop a uniform overarching legal system that accommodates both systems and fosters synergistic co-existence. The following few, simple adaptations in the current legal framework can considerably enhance the likelihood that unsolvable complexities and burdens for the government are removed, while rural poverty is alleviated and water productivity is enhanced.

- Recognize that water registration is highly complex and that its utility is limited if not nil in poverty-stricken rural areas—certainly compared to the administrative costs. Logistical realism and cost-awareness among the many scattered informal small-scale water users should guide any future efforts of the government with regard to registration. Practically, this means that for decades to come, state-led water registration should focus on the few large users and be fine-tuned to the specific management goals to be achieved with these users. At the same time, customary arrangements to reach a consensus regarding water use need to be better identified and built upon.
- Impose a government tax on large-scale water users. Water management services can partly be funded by directly taxing water users, especially if this is accompanied by the original intention of the RBM project to render these services and basin institutions more accountable and inclusive to the users. Guiding principles in developing a water taxation policy and implementation strategy could stipulate that taxation: (a) should generate net income; (b) be objective, transparent, and corruption-proof; (c) provide the right incentive, i.e., the incentive to use water more productively; (d) contribute to poverty alleviation, or at least not aggravate poverty; and (e) be linked to accountable service delivery.

- Disconnect payment of water services from entitlements to water, in order to eradicate the notion that ‘everybody who paid for water can use as much as he or she wants, even at the expense of fellow-users’.
- In drafting the new national legislation, allocate priority rights, not only for basic domestic water uses but also for small-scale productive water uses that allow the poor to better meet basic income needs in cash and kind and contribute to agricultural growth.
- In the localized cases of dry-season water scarcity, recognize and strengthen effective existing institutional and technological customary water sharing arrangements at the lowest appropriate level and develop the government’s facilitating role in fostering upstream-downstream dialogue to solve conflicts more effectively.
- Promote investments in human, financial, and technical resources in water development, e.g. for groundwater use and storage of surface water, in order to prevent conflicts and allow everybody to derive more benefits from the otherwise unused water.

Annex 1

Table 1. Fees according to Water Utilization (Control and Regulations) Act of 1974.

Item of water use	Application fees in US\$	User fees in US\$/annum	
		Flat rate	Increment rate
Domestic/livestock	40	35	0.035 per 100 m ³ above 3.7 l/s
Small scale Irrigation	40	35	0.035 per 1000 m ³ above 3.7 l/s
Fish Farming	40	35	0.035 per 100 m ³ above 3.7 l/s
Large Scale Irrigation	150	70	0.070 per 100 m ³ above 3.7 l/s
Industrial	150	35	0.035 per 100 m ³ above 1.11 l/s
Commercial	150	35	0.15 per 100 m ³ above 0.94 l/s
Mining	150		0.17 per 100 m ³

Table 2. Non-consumptive water use fees in Tanzania.

Use	Charge in US\$ /Annum
TANESCO – Power Royalty	165,500
Power Royalty Fees per 1MW installed capacity	300
Transport in inland water bodies (less than 5 tons)	10
Transport (above) for every additional Ton	2,2

Note: Exchange rate (2004): US\$1 = TSh 1000.

Annex 2

*Table 1. Estimated costs of the Rufiji Basin Office**

Cost Element (\$)	Estimated amount
Remuneration – Basin Officer	8,640.00
Remuneration – Resource Management staff (2)	7,200.00
Remuneration – Quality Management staff (2)	6,000.00
Remuneration – Operations staff (5)	4,800.00
Remuneration – Corporate Services	5,000.00
Remuneration – Casual labor	13,860.00
Institutional Support (including resolving conflicts)	11,900.00
GIS data capture	12,100.00
Water quality analysis/ hydrology sampling and analysis	9,200.00
Fixed overheads	4,500.00
Travel and subsistence	37,000.00
Printing and photocopies	8,700.00
Communication	11,000.00
Bills (electricity, water)	3,900.00
Consultants	-
Sundry and contingency	6,700.00
Interest and finance costs	5,000.00
Total	155,500.00
Other expenditures (occasional)	
Improvement of intakes	37,300.00
Formation of WUAs	7,800.00
Water resources analysis	5,400.00
Board meetings	6,240.00
Water resource management strategy	11,200.00
Total	67,940.00
Grand Total	223,440.00

Source: Sokile 2004.

*Costs exclude assets such as buildings, furniture, computers, photocopiers, motor vehicles/bikes, and laboratory equipment.

Literature Cited

Government legislation and project documents

Act No. 10 of 1981. Dar-es-Salaam: The United Republic of Tanzania..

Ministry of Agriculture and Food Security – Japan International Cooperation Agency. 2003. *National Irrigation Master Plan*. Dar-es-Salaam: Ministry of Agriculture and Food Security, Government of United Republic of Tanzania.

Ministry of Water and Livestock Development, United Republic of Tanzania. 2002. *National Water Policy*. Dar-es-Salaam: The United Republic of Tanzania.

Subsidiary Legislation of 1974. Government Notice No. 347 of 1994 under section 38(2) of the Water Utilization (Control and Regulation) Act No. 42 of 1974. Dar-es-Salaam: The United Republic of Tanzania.

The Water Ordinance of 1959. Dar-es-Salaam: The Governor of Tanganyika.

United Republic of Tanzania/Ministry of Water. 1995. *Rapid water resources assessment*. Vols. 1 and 2. DANIDA/World Bank.

Water Ordinance 1923.

Water Ordinance of 1948, Chapter 257. Dar-es-Salaam: Government Printers.

Water Utilization (Control and Regulation) Act of 1974. Dar-es-Salaam: The United Republic of Tanganyika.

Water Utilization (General) (Amendment) Regulations. 2002. Dar-es-Salaam: The United Republic of Tanzania.

Water Utilization (General) Regulations of 1997. Dar-es-Salaam: The United Republic of Tanzania.

World Bank. 1996. Staff Appraisal Report, Tanzania. In “River Basin Management and Smallholder Irrigation Improvement Project.” Report No. 15122-TA. Washington: Agriculture and Environment Operations, Eastern Africa Department.

Other references

Bruns, B.; Meinzen-Dick, R. 2003. Framework for water rights: An overview of institutional options. Key note paper presented at the International Working Conference of Water Rights: Institutional Options for Improved Water Allocation, 12-15 February, Hanoi, Vietnam.

De Soto, H. 2000. *The Mystery of Capital. Why capitalism triumphs in the West and fails everywhere else*. London: Black Swan Books Transworld Publishers.

Lankford, B. A. 2004. *Irrigation improvement projects in Tanzania: Scale impacts and policy implications*. Accepted for publication by Water Policy.

Lankford, B. A.; van Koppen, B.; Franks, T. 2004. *Entrenched views or insufficient science? Contested causes and solutions of water allocation; insights from the Great Ruaha River Basin, Tanzania*. Accepted for publication by the Agricultural Water Management. Forthcoming.

Lankford, B.A.; Sokile, C.S. 2004. *The River Basin Game Manual*. IWMI Research Report. Colombo: International Water Management Institute. Forthcoming.

- Machibya, M.; Lankford, B.; Mahoo, H. 2003. Real or imagined water competition? The case of rice irrigation in the Usangu basin and Mtera/Kidatu hydropower. Paper presented at the Tanzania Hydro-Africa Conference, 17-19 November, at AICC, Arusha, Tanzania.
- Maganga, F.P. 1998. Indigenous knowledge and irrigation development in Tanzania: Experiences from Msanzi, Nyeregete and Musa Mwijanga farmer-managed irrigation schemes. Paper presented at the Scandinavian Seminar College on African Perspectives on Policies and Practices Supporting Sustainable Development, Harare, October, 1998.
- Maganga, F.P.; Hilda, L.; Kiwasila, I.; Juma, H.; Butterworth, J.A. 2003. Implications of customary norms and laws for implementing IWRM: Findings from Pangani and Rufiji basins, Tanzania. Paper presented at the WARFSA/WaterNet international symposium October 2003, Gaborone.
- Mamdani, M. 1996. Citizen and subject: Contemporary Africa and the legacy of late colonialism. In *Princeton studies in culture/power/history*. Princeton, New Jersey: University Press.
- Msyua, I. 2003. The role of water rights. Unpublished paper presented at the Seminar Ruaha+10, Morogoro, 11-12th December.
- SMUWC. 2000. *Interim report supporting Volume A Water, Supporting Report 2, Water Management*. For the Directorate of Water Resources, Ministry of Water, Government of Tanzania, The SMUWC (Sustainable Management of the Usangu Wetlands and Its Catchment) Project, Mbeya Region, Tanzania.
- SMUWC. 2001. *Final project reports*. Directorate of Water Resources, Ministry of Water, Government of Tanzania., Dar-es-Salaam. The SMUWC (Sustainable Management of the Usangu Wetlands and Its Catchment) Project, Mbeya Region, Tanzania.
- Sokile, C.; van Koppen, B. 2003. Local water rights and local water user entities: The unsung heroines of water resource management in Tanzania. Paper presented at the 4th WARFSA/WaterNet Symposium, 15-17 October, Gaborone, Botswana.
- Sokile, C. 2003. Fact sheet on water rights. Unpublished paper. In "Raising Irrigation Productivity and Releasing water for Intersectoral Needs (RIPARWIN)" project. Morogoro: Sokoine University of Agriculture, University of Dar-es-Salaam, IWMI, University of East Anglia.
- Sokile, C. 2004. *Estimated costs Rufiji Basin Office*. Field Notes, Ph.D. research.
- Talking about Usangu*. 2001. Produced and directed by the Ministry of Water and Livestock, Dar-es-Salaam, Tanzania. Videocassette.
- United Nations Development Report. 2002. *Deepening democracy in a fragmented world*. New York: United Nations Development Program.
- Yawson, D.K.; Kashaigili, J.J.; Mtalo, F.W.; Kachroo, R.K. 2003. *Modelling the Mtera-Kidatu reservoir system to improve integrated water resources management*. Report presented at the Hydro-Africa Conference, 17-19 Nov., AICC-Arusha, Tanzania.

Postal Address:

P O Box 2075
Colombo
Sri Lanka

Location

127, Sunil Mawatha
Pelawatta
Battaramulla
Sri Lanka

Tel:

+94-11 2787404

Fax:

+94-11 2786854

E-mail:

iwmi@cgiar.org

Website:

<http://www.iwmi.org>