

*Between prescription and practice: Irrigation water pricing policies in context*, edited by  
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**Water Rights and Water Fees in Rural Tanzania**

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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 and fee payment system with the aim of improving basin-level water management and cost-recovery for government water-resource management services. This chapter 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. Growing water demands intensify water scarcity during the dry season. Contrary to expectations, the new system has failed as a registration tool, a cost-recovery tool, and a water management tool, and has also hampered rural poverty alleviation. As a cost-recovery tool, the system drains government coffers because the collection costs are higher than any revenue gained. Moreover, rate setting and enforcement are highly subjective and arbitrary. 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, among the few private large-scale water users cost-recovery according to negotiated rates appeared to be feasible. The chapter argues that the new water rights system fits the relatively better-off minority to some extent, but that it is an anomaly for Tanzania's majority of poor water users. Yet, for all water users in a water-abundant country like Tanzania, the overemphasis on water regulation risks diverting scarce human and financial resources from the only win-win option, which is further water development. The chapter concludes by suggesting easy adaptations in the current water rights system that would accommodate both large-scale and small-scale water users, improve cost-recovery for government services, mitigate water conflicts and alleviate rural poverty.

## 1. Introduction

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. Physical water resources are abundant. 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. An estimated 50 percent of all annual surface run-off flows into the Indian Ocean and the large lakes (URT 2002). However, temporal and spatial variability in rainfall and surface flows are high. Yet, Tanzania's level of infrastructure development to harness water and to mitigate nature's variability is still very low, primarily because of the lack of the financial, technical, and institutional resources to bridge the infrastructure gap. Only 6.3 million hectares (15 percent of the total arable land) is under rainfed and irrigated cultivation. Further, 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 the underdeveloped water resources include livestock, forestry, mining, tourism, industry, and fisheries (URT 2002).

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 what was seen as a scarce 'economic' 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. The fee also concerns all water users who invest privately in water infrastructure. In state-supported irrigation schemes, the fee is additional to the partial or full cost-recovery of infrastructure construction, operation, and maintenance. In the piloted 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.

The government also started advocating stronger user participation in the river basin Water Boards, which were fully governmental up to the mid-1990s. It further 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 (World Bank 1996).

With all ingredients present for what was then seen as the best practice of integrated water resources management, the first results of implementation 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, one of the two basins in which the River Basin Management (RBM) Project, funded by a loan from the World Bank, implemented the new water rights system on a pilot basis, and focus of this chapter. In this context of the Upper Ruaha, neither of the two goals of cost-recovery for water management services by the government nor wiser water use to solve the water scarcity problem has been achieved, at least among the majority of small-scale users.

The Upper Ruaha catchment covers an area of 21,500 km<sup>2</sup> 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 diverted 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. More than two thirds of the intakes were constructed after 1970 (SMUWC 2000a, SMUCW 2000b, Sokile and Van Koppen 2004).

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' own irrigation development has been accompanied by robust customary water management institutions at scheme level. Communities govern the construction and maintenance of *dindilos* and diversion canals, and water distribution within the local schemes. 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). In the dry season, rotation between the respective schemes covers villages along long stretches of the common stream (Sokile fieldnotes)<sup>1</sup>.

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<sup>1</sup> An example of customary inter-scheme water rotation (locally known as *zamu*, or 'turn') is the Mlowo tributary to the Mkoji. At the beginning of the critical dry period, local leaders and canal committee members from four villages, other formal and informal water right holders, two private farmers, the government-owned Langwira seed farm, the NARCO ranch, and representatives of

However, in the past two to three 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 the past. Some downstream *dindilos* and schemes have been abandoned for this reason, while former perennial flows now dry up for at least four 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). Some individual downstream farmers started to rent irrigable land in upstream farmer-managed irrigated areas. 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 storm water and 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 FAO already proposed in the 1960s, but that was shelved for many years when discourse focused on regulation, for the reasons mentioned in this chapter. It 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.

Further downstream are the Mtera and Kidatu hydropower plants. The Great Ruaha fills these dams with the floods during the rainy season; the contribution of the small dry season flow is very limited. Hence, the remaining sections exclude the hydropower plants as stakeholders in the upstream-downstream conflicts in the Upper Ruaha catchment.

This chapter focuses on the implementation and impacts of the new water rights and fees system among this majority of small-scale water users in the Upper Ruaha, which encompasses the typical mode of partially water-controlled farmer-managed irrigation which constitutes 64 percent of Tanzania's irrigated area. Section two analyzes the origins of the new nation-wide water rights and fees system, which suddenly broke with the water development agenda up till the early 1990s, in order to put water scarcity and conservation at the center stage and to introduce a water regulation agenda based on extraordinarily levels of water control by the government. In particular, it analyzes the formal legal framework that was inherited from the colonial powers since 1923 and consisted of highly centralized water

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pastoralist from four villages further downstream - Mahongole, Mhwela, Mwatenga and Kilambo - come together to agree on a weekly rotation. On Sundays water is left to flow for domestic uses, including brick laying along the banks, and for the users further downstream that are not part of the *zamu*. The distance between the upstream and downstream participants is 24 km.



authorities, who –up till 1994— maintained a dormant administrative system of water rights for large-scale users. This system was taken as the basis for grafting the new nation-wide system of water rights allocation and fee payment to generate revenue for the self-financing of new basin-management institutions and activities. Payment and valuing water as an economic good were expected to stimulate water conservation and saving.

The three subsequent sections evaluate the implementation processes on the ground in the Upper Ruaha basin and the impacts of the new water rights and fees system as a registration, cost-recovery, and water management tool. Section three discusses the administrative weaknesses of the registration system. A weak registration tool is a shaky foundation for a cost-recovery tool, as elaborated in section four. Section five highlights how the new water rights and fees system failed as a water management tool, even aggravating upstream-downstream conflicts in the dry period. The chapter concludes in section six by identifying the minor changes in the current water rights system towards logistically realistic registration, towards cost-recovery that generates net benefits for government, and towards water management to support local problem solving during the dry season. Above all, it recommends to also return to the water development agenda that Tanzania left in the 1990s and to allocate the bulk of the scarce financial, human, technical, and institutional resources to the only win-win solution of *increasing* the pie of accessible water resources for all instead of *dividing* an increasingly limited pie. Addressing water scarcity should not silently imply that the Upper Usangu, Tanzania, and indeed many other agrarian countries Africa have to remain at the level of underdevelopment of their water resources where they are now.

## **2. The crafting of the new water rights and fees system**

### **2.1 Water Legislation in Tanzania up till 1990s**

#### *History of formal water rights, registration, and fees*

The water rights and fees system that the government designed in the 1990s and that the RBM project piloted in the Rufiji basin builds in various ways on the formal water law that was introduced to Tanzania by German and British colonial settlers in the early 1900s. State ownership of water is one aspect which has colonial roots. Settlers vested localized water rights in settlers in areas of intensified agricultural water use, for example around Kilimanjaro. While this enabled water management among themselves, it was an act of appropriation and exclusion of those without water rights at the same time. In 1948 the then colonial state appropriated water nation-wide for the then prevailing boundaries, at least by paper 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.

Another old aspect of the water law is its highly centralized, top-down nature, even though the 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, the Water Office 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, and to approve 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’<sup>2</sup> 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].<sup>3</sup> 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 administrative water rights system that accompanies Tanzania’s centralized legal control over water also dates from the early 20<sup>th</sup> century. Registration to obtain a paper water license, permit, or right from the recognized water authority of the era 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, other water users 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.

Until the early 1990s, the aspects of this administrative water rights system that were to be transformed later had hardly been used. The formal agreements embodied in the paper water right were limited. The certificate usually only mentioned 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, if stipulated at all, was typically the Water Officer’s best subjective guess of an average annual volume. Infrastructure and measuring devices were absent and there were no compelling reasons to build those just for the sake of water registration and management. This paper water ‘right’ had limited practical implications as a water management tool. It was certainly clear that “nothing in any such water right shall

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<sup>2</sup> Water Ordinances 1959 5–(4); Water Utilization (Control and Regulation) Act 1974 6–(2).

<sup>3</sup> From 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.

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). Water Officers have limited means to do more than regulating new entrants, stipulating conditions to be attached to certain water rights, and perhaps mediating in water conflicts as they have the formal power to curtail excessive water abstractions by titleholders and manage water scarcity situations – if the available infrastructure allows measurement and control.

Similarly, the colonial and post-colonial governments had ascribed the authority to itself 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.

In sum, 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. The significance was 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. The latter became the key issue for the small-scale water uses by the original rural inhabitants of Tanzania.

#### *Exclusion of informal and customary rights*

For long, small-scale rural water uses were under the customary authority of the tribal chiefs. In the colonial era, these uses 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)].

This secondary status gradually and implicitly shifted to ‘illegal use’ once registration for water rights was made increasingly compulsory for all those who “divert, dam, store, abstract and use” water. The next 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). Perhaps guided by great optimism about the ease of recognizing everybody's share in this national resource and the ease of registering all users in the new democracy, this measure did imply that from 1974 onwards, any de facto unregistered customary small-scale water use became de jure illegal, including 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, there was a silent consensus among water professionals, at least up till the early 1990s, that the existing dichotomy between 'large-scale modern' and 'small-scale rural-traditional' cannot be overcome by simply superimposing an alien legal system designed for few large-scale users on customary arrangements among the many small-scale users.

## **2.2 Legal Reform in the 1990s**

### *Introduction of blanket cost-recovery*

From the early 1990s onwards, water policies and legal frameworks suddenly changed towards further imposing the formal system that had worked for the few large-scale users as a blanket measure for all Tanzanian water users, while newly introducing volume-based fees for water use. 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 ( $m^3$ ) 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 cost-recovery" (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.

*Assumptions underlying the reform: From water development to water regulation*

This change of a dormant administrative system for a few large-scale water users into a blanket cost-recovery system for water management fell in a period in which Tanzania also introduced cost-recovery for many other government services, such as domestic water supply, health services and education—radically breaking with the socialist past in favor of the structural adjustment and privatization programs. 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.

A driving force behind the transformation in the water sector 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 Staff Appraisal Report (World Bank 1996) for the formulation of the 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 is implemented by the Ministry of Water and Livestock Development.<sup>4</sup> The drafting of the new National Water Policy of 2002 is part of the same project and reflect the same assumptions.

The diagnosis in these various documents is that there is 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.<sup>5</sup> Instead, a regulatory agenda would be needed,

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<sup>4</sup> The 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.

<sup>5</sup> The government’s endorsed this sudden policy shift from development to regulation as a loan condition of the RBM project. The shift is 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.

especially in the Pangani and Rufiji basins, because: “In both these basins there are serious user conflicts, deterioration of resources due to misuse and lack of comprehensive planning and management mechanisms” (URT/MOW 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<sup>6</sup>. 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).

*Fee payment 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 water users fees nor the charges for the infrastructure and operation to deliver water cover the true cost of the resource. According to the report, this had 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).

Cost-recovery was expected to solve these two problems at the same time. First, cost-recovery 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

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<sup>6</sup> Recent studies by Machibya et al (2003) and Yawson et al (2003) show that the reduced electricity production in 1993 had no relationship with upstream water flows, but had been caused by deviating from the originally designed management arrangements of dam storage within the stretch between Mtera and Kidatu.

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, cost-recovery was expected to contribute to managing water as an economic good. Volume-based cost-recovery would represent “the allocation of water as a public good and as an economic good 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 cost-recovery. ‘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 the proposed “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 cost-recovery and water management*

The existing water rights and registration system was welcomed as a good and readily available basis for cost-recovery 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 1996, section 1.25). Six years 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 in registering, charging fees, 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 cost-recovery 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, as all water users are 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. Among the few large-scale water users, the new system only worked as cost-recovery tool.

### **3. Registration Tool: Limited Information**

#### *Partially available data: Names and uses*

The register in the Rufiji Basin Water Office in Iringa has started to compile a considerable list of names of water users and the purposes of their water use. By mid-2003 the data base contained 990 water rights issued 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 (Sokile field notes).

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 more than 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,

and may be related to the outflow of Germans, Baluchis, Greeks after independence in 1961 and the Arusha Declaration in 1967, which announced further nationalization. However, even in the most recent applications, abandonment of the water right occurs (Sokile field notes). Probably, other cases of abandonment of water rights, e.g. by people who have died or moved out of the region, have not been notified as yet.

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

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, many actual water users have not been registered as yet. Recently, an inventory of unregistered water users in the Rufiji basin was conducted, which estimated that the number of unregistered users is 573, so more than half of the registered users (Msuya 2003).

#### *Estimates: Sites*

Any other information than names and purposes of water use becomes much more problematic. Information about the sites where water is used is only documented in the register by 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. Obviously, this lack of clarity of the sites of 'water rights' caused serious confusion in water disputes in the area that relied on the formal water rights in trying to solve the problem (Maganga et al. 2003).

#### *Lack of data: Volumes*

The weakest part in the registration system concerns the figures for annual volumes of water use. Only 28 percent of the rights registered have any volume at all. 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. This lack of reliable and accurate data on volumes of water allocated, let

alone volumes of water used, is inevitable. The high seasonal and annual variability of runoff, streams, and water abstracted and the general lack of any measuring devices render 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 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. In fact, even the most sensitive hydrological models based on information from ample flow monitoring devices 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. Therefore, there are no grounds at all for the assumption that the administrative system –or even hydrological models—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). Only if water resources are fully developed into highly controlled systems can volumes be sufficiently known and manipulated – a rare situation even in developed countries.

#### *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 and updating changes are extremely high. The question is whether the costs of blanket registration are justified in the light of the limited benefits of the registration system as basis for charging fees (section 4) and managing water and water conflicts (section 5).

## **4. Cost-recovery Tool: Arbitrariness by Design and Draining Public Funds**

### **4.1 Arbitrariness by Design**

The administrative water rights system was never designed to charge fees. Indeed, insurmountable problems arose as soon as this administrative system became the foundation for volume-based blanket cost-recovery for government's water management services among all. First, the lack of objectivity and transparent procedures incorporates 'arbitrariness by design' into the new system of water rights and fees in at least four ways: in rate setting; enforcement of cost-recovery; handling of public funds, and in discouraging genuine organization. Second, among small users, the system appeared to drain funds, instead of generating funds. Third, it met with fierce protest on the ground.

#### *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 judgment. 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 mitigate the problem of rate setting along some range of volumes, 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.

Significantly, among private larger water users, rates were not set on the basis of water volumes used, but rather negotiated with the Water Officers. Payment followed promptly (Sokile 2003). So willingness and ability to pay seems a much sounder basis for rate setting than highly contestable hypothetical water volumes.

#### *Arbitrary and weak enforcement*

Significantly, 92 percent of private companies/estates, such as Brooke Bond Tea Co. Ltd or Tanzania Wattle Co. Ltd. fulfill their duties (Sokile 2003). Yet, enforcement of

payment appeared most difficult vis-à-vis other government agencies. Only 38 percent of the government agencies holding water rights (e.g., local government for domestic supply and state farms) regularly pay fees. In the Mbarali and Kapunga State Farms, in particular, the arrears in payment are among the highest and the cash installments paid during each trip are typically small. In these schemes, where the Water Officers have the control over scheme operational devices to cut water use, enforcement remains difficult. The argument ‘why should the government pay the government?’ is used to justify such arbitrary cost-recovery, but jeopardizes the goal of cost-recovery for the functioning of the basin offices.

Cost-recovery varied among the remaining water users, including smallholders and livestock keepers. The main threat that the limited staff on the ground can use is intimidation that defaulters will be brought to court, which mainly works in the case of the least powerful. In case of reluctance to pay, time and transport costs of repetitive reminders are high, let alone the costs of initiating a court case. The threat to cut access to water in case of non-payment can hardly be implemented because 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<sup>7</sup>. These various forms of arbitrariness render every water officer vulnerable and prone to criticism, if not accusations of corruption, against which he lacks any objective defense.

#### *Arbitrariness in 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 apply collectively for one water right, for example as existing farmer association or by forming a WUA. 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 24 WUAs have been formed in the Upper Ruaha catchment (Sokile 2003). Although the WUAs are still too young to assess impacts, the risks are real that the rapid ‘organization’ into some form of committee revives the same type of corruption that existed

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<sup>7</sup> Collecting and transfer of public money is a new task for Water Officers. For the moment, Water Officers are accountable by writing receipts for taxes received. 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. An administrative system that inserts fee payments into the Excel sheet of registered water users is still to be developed. An alternative is to include water cost-recovery in the mandate and implementation channels of the Tanzania Revenue Authority, which has much more experience in these matters.

under government-imposed villagization and cooperative-building, as also prevailed in the Upper Ruaha sub-basin (Gaussen 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. If seen as powerful, they can more easily interfere in the customary irrigation arrangements or threaten to do so. Thus, the commonly shared water resources risk becoming a source of income for the few—again hitting the most powerless the hardest. Moreover, if organization mainly leads to having to pay fees, the incentive to organize is low indeed.

#### **4.2 Draining Public Funds**

Contrary to expectations, charging fees for cost-recovery among 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. The distances in the Rufiji basin from the Water Office to the water users are much higher. An estimated average is 87 km from either the Iringa or Rujewa basin offices (Sokile 2004). So the fuel costs for collecting taxes from small-scale water users typically requiring three trips per year amount, on average, to US\$392, divided by the number of water users that can be reached during one trip. This still excludes the costs of the four-wheel drive vehicle purchase and maintenance, the salaries and per-diems 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 is not included in this because

it remains 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. Yet, cost-recovery appeared feasible among large-scale water users.

### **4.3 Lack of Legitimacy**

The government's new cost-recovery efforts have 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 is needed for the vehicles, fuel, construction and office costs of the Rufiji Basin Water Office, did not convince 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, one would even have expected a categorical rejection of the new system. Ironically, the reason for its partial acceptance could be found 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 cost-recovery, 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). The efforts by the Ministry of Water and Livestock Development to introduce new rural taxes are in even sharper contrast. 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.

### **4.4 Conclusion**

Imposing a blanket cost-recovery system on small-scale water users failed to achieve the expected goal of self-financing governmental basin management. Instead, it appeared to drain scarce government resources. The new system lacks legitimacy as no service is improved and as water cost-recovery is at odds with the general rural cost-recovery policy at national level. Government credibility is further weakened because of the arbitrariness of the new system.



Furthermore, the contested system aggravates poverty. At the same time, among the large-scale private users who derive considerable benefits from water use, ability and willingness to pay emerged as a feasible principle for some degree of net cost-recovery for basin management services.

The straightforward win-win solution is to focus cost-recovery on those who can easily be reached logistically, efficiently and politically, and exempt the rest. Once logistical capabilities are further developed and political considerations carefully weighed, taxation of other water users can be phased-in<sup>8</sup>. Last but not least, the government should clarify that there is no simple connection between payment of taxes and claims to water. Cost-recovery and access to water are separate matters of public choice. As discussed below, disconnecting claims to water from payment is also likely to *save* water.

## **5. Water Management Tool: Increasing Water Use and Inequities**

The expectations of the RBM project and the National Water Policy of 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. Making people pay for water completely failed as water management tool and even aggravated downstream water scarcity.

The above-mentioned lack of water measuring and control devices that prevented Water Officers from cutting access to water, and the lack of effective authority to enforce this otherwise, not only concerned the enforcement of registration and fee payment, but water management in general. These limitations are the ‘Achilles heel’ for any water rights system that derives its impacts from government’s top-down curtailment of water use. More specifically, water certificates with, at best, an average annual volume have no meaning at all for the key water problem in the Upper Ruaha, which is the dry season in which fractions to be used are much smaller than any average, certainly for downstream users.

Ironically, the newly introduced payment of water ‘as an economic good’ even exacerbated water scarcity downstream during the dry season. Without a vision on government’s role in mitigating water conflicts, the Water Officer had started issuing water rights to the upstream irrigators. They were somewhat wealthier and already quite well

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<sup>8</sup> For 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).

organized. In that area, irrigation expanded rapidly, for example up to 40 percent as in Inyala village, where land values were doubling as well. This rapid expansion was triggered by market and other opportunities, but also by the newly constructed intake structure under the RBM – SIIP project, which increased water security in the dry season. Although reluctant, they also registered and paid fees. The promise of the Water Officer during those initial days that those who registered and paid the new fees would be better supported in water conflicts than those who had not paid as yet helped to convince them and others. It certainly facilitated the Water Officer’s job of achieving quick registration and tax payments. Yet, the Water Officer hardly contacted and informed the largely unorganized livestock keepers and the fragmented in-migrating communities in the plains downstream. Not a single WUA has been established in that area.

As a result, the irrigators in Inyala village used the fact that ‘since 2000 they had bought water for US\$100’ to strengthen their rights to exploit this precious resource to the maximum, unlike the downstream users who had no water rights. Similarly, 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. With the ending of project funds, it will not do forever. So contrary to the assumption of the RBM project and National Water Policy of 2002 that payment for water leads to reduced water use, water use was increased. 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 before.

Evidently, registration and tax payment did not generate any extra drop of water in the zero-sum game of dividing a limited pie during the dry season in the Upper Ruaha catchment. 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), as mentioned in section two<sup>9</sup>. Realizing the likely repercussions of ‘selling unrealistic expectations’, the Water Officer started protecting himself by emphasizing the disconnection between fee payments and water availability. Recently, the Water Officers stopped issuing water rights altogether. They now give priority to the mere inventory and registration of all users.

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<sup>9</sup> As mentioned in section 2, the 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’

If the government sees a role for itself in managing upstream-downstream water conflicts, it should clearly distinguish cost-recovery from water management. The government could set the basic frameworks and principles of water sharing and catalyze the formation of effective forums, as it started to do in collaboration with other projects in bringing the managers of the three smallholder irrigation schemes, TANESCO, and the Ruaha National Park together into what is now called the Planning Group, or using RIPARWIN's River Basin Game to stimulate inter-scheme debates and problem solving. Local stream rotation and conflict mitigation arrangements are the most precious resource to tap. Water distribution principles and infrastructure should accommodate the highly varying water quantities, for example, by exploring the merits of proportional distribution of water flows. This is easier to design and more transparent to monitor and enforce. If the government seeks to ensure that all get water, the bottom-line is that they should protect the downstream and otherwise disadvantaged losers.

## **6. Conclusions and Recommendations: Differential Regulation Plus Blanket Water Development**

Co-funding of basin management functions by users, registration of names of users that allows invoicing where feasible, and the mitigation of growing water scarcity in the dry season remain important issues that had not been addressed before the 1990s. These completely different issues require different solutions. The pilot implementation of the new water rights and fees system in the Upper Ruaha suggests that the following few, simple adaptations in the current legal framework would effectively address these issues, while avoiding the many problems encountered.

- For decades to come, state-led water registration should continue to focus on the few large users and be fine-tuned to the specific management goals to be achieved with these users. Registration of the many scattered informal small-scale water users in poverty-stricken rural areas should be guided by logistical realism and awareness of the balance between the costs and the ultimate benefits.
- However, invisibility of small-scale users in an administrative system should not reduce the formal legitimacy of their claims to water. On the contrary, not only basic domestic water uses but also small-scale productive water uses that allow the poor to better meet basic income needs in cash and kind and to contribute to agricultural growth, should be given priority rights, for example as a blanket measure.

- Large-scale water users are able and willing to contribute to the costs of basin water management services. Their support to water management functions is an effective way to better distribute the benefits of the common resource of water that large-scale users derive. Sharing of benefits is to challenge 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 order to mitigate dry-season water scarcity, which is invariably most articulate at local level in a country that has abundant water resources, effective existing customary water sharing arrangements at the lowest appropriate level need to be tapped and strengthened while the government facilitates fostering upstream-downstream dialogue, also over longer stretches of streams if needed.

Yet, this regulation agenda is only a small part of water resources management. Perhaps the major oversight of the RBM-SIIP project was that it diagnosed water scarcity and conflicts were the single most important issue in Tanzania, and, therefore, fully discarded the water development agenda of 1991. Yet, an agenda of targeted regulation, as recommended above can and should go together with an overall agenda of water development. In fact, improved storage to increase the pie of available water resources for all is the only longer-term win-win option to address dry season water scarcity. Also, only by investing in water development can benefits be generated to pay for any fees. A water development agenda makes a regulation agenda work. Therefore, the water development agenda of 1991 should be revived with force.

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 <sup>3</sup> above 3.7 l/s
Small scale Irrigation	40	35	0.035 per 1000 m <sup>3</sup> above 3.7 l/s
Fish Farming	40	35	0.035 per 100 m <sup>3</sup> above 3.7 l/s
Large Scale Irrigation	150	70	0.070 per 100 m <sup>3</sup> above 3.7 l/s
Industrial	150	35	0.035 per 100 m <sup>3</sup> above 1.11 l/s
Commercial	150	35	0.15 per 100 m <sup>3</sup> above 0.94 l/s
Mining	150		0.17 per 100 m <sup>3</sup>

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 (IN \$)	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
<b>Total</b>	<b>155,500.00</b>
<b>Other expenditures (occasional)</b>	
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
<b>Total</b>	<b>67,940.00</b>
<b>Grand Total</b>	<b>223,440.00</b>

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Source: Sokile 2004.

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

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