Water Tenure and Conflicts in Tanzania

Institutional Responses to Changing Tenure Patterns

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Abstract

This short document summarises some of the findings of recent ACTS research in Tanzania. It examines the current state of water availability in Arusha, Tanzania, and the conflicts which are emerging due to resource scarcity and other more complex factors. A full report on water policy issues in Kenya and Tanzania is soon to be published by ACTS. It includes a history of water development in both countries, a number of case studies, and policy recommendations. Ordering details will soon be available on this website.

Introduction

"The people from the government came and said, 'The water belongs to the nation, and you must share it.' But the villagers said 'No, the water is ours' and armed themselves in order to fight".
Anna Sembeo of Oldonyosambu village, Arusha Region, Tanzania

This paper looks at the water policy of Tanzania, focussing especially on recent attempts to move towards a participatory, demand-management approach to rural water supply. This focus on rural water availability is motivated by the fact that approximately 80% of the population of Africa is found in rural areas, and only about 37% of these people have access to 'safe' water sources.[1] Part of the research included fieldwork conducted by ACTS[2] in the Arusha region of Tanzania, which highlighted a number of latent and manifest conflicts over water. Water availability is

[1] World Health Organisation, 1998, *Water Supply and Sanitation Sector Monitoring Report, 1998*
[2] Research included interviews with focus groups in villages around the town of Arusha, interviews and correspondence with Ministry of Water staff and other water specialists, and a three-day ACTS workshop on water policy in Kenya and Tanzania.

diminishing as a result of erosive land use-patterns, poor management, and the increasing number of abstractions. Conflicts range from potential problems over incompatible requirements of different types of users, to acts of vandalism and physical fighting over shared water sources. The disputes are rarely straightforward in nature, but it is clear that management problems and disputes over water are often symptoms of uncertainties over 'ownership' of water. A number of aspects of water tenure are dealt with in this paper. Tenure concerns not just local rights to water sources, but also the legal status of water being a national resource, to be allocated by the state on behalf of the people. To what extent is this view shared by water users?

Water rights include participation in the decision-making processes which affect water use, at both the local and national levels. There is a need for more community participation, which should go hand-in-hand with various types of training. Currently there is only limited use of hierarchical Water User Associations (WUAs) to mediate the use of shared water resources, leading to poor water conservation practices, and insufficient institutional space for all stakeholders to influence water policy. As a result, there are many inequalities in access to water. These include the lack of control over water sources often experienced by women and the poor, as well as downstream users who are worst-hit by diminishing water flows.

The report highlights the need for increased stakeholder participation in local and regional policy formulation, as well as clarification in the area of water tenure. It emphasises the need for co-ordination of state agencies, communities, and NGOs to avoid overlaps of responsibility, and identifies possible ways in which key aspects of the draft Tanzania National Water Resources Management Policy (which was in preparation at the time of writing) could be implemented.

State Activities in the Rural Water Sector

Systematic state intervention in the water sector in mainland Tanzania began around 1930, when the government started to use public money to build water schemes[3]. The beneficiaries were towns and townships as well as a few private estates and missions, and the beneficiaries would pay for all post-construction costs. The Department of Water Development was founded in 1945. It constructed schemes for local authorities, private estates and Native Authorities. Beneficiaries paid for O & M costs and some or all of the capital (construction) costs. There was thus an unequal level of coverage across the country, because of communities' varying capacity to pay for water development.

Many water rights which were allocated during the pre-Independence period allowed for very high rates of abstraction, sometimes on a 24-hr basis. The allocations were made during a time when the population was much lower than at present, and when industry and urban centres were less developed. Some of these are still valid today.

Tanzania has of course undergone huge changes in political outlook since Independence, and the history of water development since 1961 reflects these changes.

From 1964, the government moved towards socialist social policies, which pledged to put basic needs (e.g. health, water, education, food supply) high on the agenda, and to

[3] Mujwahuzi and Maganga, 1997, *Domestic Water Use and Environmental Health in Tanzania*, unpublished

encourage equitable development, especially in rural areas. However, there were no clear guidelines regarding which villages should have priority in water development. Later, the *ujamaa* villages were given priority, but there was otherwise no clear prioritising mechanism. Generally, the most geographically marginal people were most likely to be neglected.

From 1965 the central government provided funding for all capital and maintenance costs of water distribution development. Local Authorities continued to pay for operational costs. In 1969 however, even these operational costs were covered by the central government. Thus, by 1970, the only Tanzanians paying for water were those who had private water connections.

There has been much direct involvement of foreign NGOs in the water sector. By 1986 the ratio of external to internal funding of the rural water sector was 80:20 - Tanzania has received more foreign aid per capita than any other sub-Saharan country - and donors had a corresponding amount of power in programme planning and project design. Through 'direct financing' of projects which were implemented by NGOs or private contractors, rather than going through government departments, donors could control use of the funds. In general, donor-funded projects which didn't involve Ministry staff were completed more quickly than those that did, partly due to their superior access to equipment. However, there were a number of key problems with this 'bypass' project approach, including the tendency to use Tanzania as an experimental testing-ground for new strategies, possibly at the expense of best practice.[4] Additionally, donors, unlike the Ministry, aren't compelled to attempt to co-ordinate each other's strategies on a nation-wide scale. An even more serious problem occurs when donor countries supply technical staff, and do not emphasise capacity-building elements. Sometimes these expatriate experts use state-of-the-art methods in surveying and planning, and as these capabilities are beyond the present capacity of Tanzanian staff, the process tends to collapse once the technical assistance ends.[5] Indeed, some donors may have commercial interests that influence their choice of personnel and technology, which may not be the best choice.

It was not until 1987 that the government started to develop a national water policy, which was formally adopted in 1991. It reintroduced the charges for water services, in order that the water sector could recoup all costs except major capital investments. Government funding was also to be specifically limited to "basic needs facilities". In rural areas, community management and maintenance of small-scale facilities and non-monetary payments were intended to reduce the costs to local people.

Currently, the state is continuing to hand-over responsibility for existing water supply schemes to communities. Independent status has been granted to many organisations, such as women's groups, that were previously absorbed into the state, and there is now some space for the private sector in service provision. It is becoming more common for wealthy Tanzanians, individually or in small groups, to hire contractors to construct private wells, and some NGOs are converting themselves into private companies to take advantage of this trend. Since the late 1980s, the Ministry of Water has " shifted from providing services to being an enabler, regulator, controller, and monitor."[6] There are a number of reasons for such changes. Firstly, Tanzania's economy has suffered badly over the last two decades, and the government can no

[4] Mujwahuzi and Maganga, 1997

[5] Institute of Resource Assessment, Tanzania/IIED, 1993, pg. 7

[6] F.Z. Njau, Principal Executive Engineer, *Tanzania's Water Sector Review Process*, in Hirji and Patorni, 1994

longer afford to provide free services. The second reason is that donors have become less willing in recent years to channel funding through the government. This is partly because of high levels of corruption in the public sector, which increased markedly from Tsh. 6 million to Tsh. 434 million between 1973 and 1980[7]. Tanzania is able to secure donor funding by creating space in which for NGOs to operate. At present in the Arumeru district of Tanzania, a water project will typically be funded as follows:[8]

District Authorities:	5 - 20% of total
Central Government (via Ministry of Water):	40% maximum
Villagers:	15% minimum
Donors:	25 - 50%

Another big shift in policy is the establishment of River Basin Offices as a key decision-making unit for water policy and water rights allocation. As yet, two River Basin Offices are operational, Pangani (formed in 1991 and responsible for water sources in part of Arusha region) and Rufiji (formed in 1993, and by far the largest basin in Tanzania). Another 7 river basins have been identified and it is planned that each will have its own offices. Each of the existing offices has a Water Board and a Water Officer, "who implement water allocation, water rights administration and control of pollution."[9] The use of the basin system is intended to result in more rational water control based on a unit of hydrological-integrity, so that each office is working on a 'contained' water-balance within its jurisdiction. Sustainable water-use "can be achieved *only by analyzing water use in the context of the water balance of the river basin.…* water resource systems are highly integrated systems, and apparent gains in one part of the system can be offset by real losses in other parts".[10]

Because of the shift towards participatory planning and implementation of water projects, many NGOs have moved from working mainly with non-state organisations, to supporting the work of government departments. However, the fact remains that "government management style in general is top-down and directive."[11] Therefore the most important task facing all stakeholders is to help to turn the 'participatory' rhetoric of policy statements into reality.

Consumption patterns

The population growth rate in Tanzania is around 3%, which is also the average for Eastern and Southern Africa. The effect of population increase can be seen in water consumption figures: globally, total water consumption increased fourfold between 1940 and 1990 and per capita use more than doubled. In Africa, total consumption has increased about fivefold, but per capita consumption has only increased negligibly over the same period.

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[7] Osei-Hwedie, 1998
[8] Interview with Mrs Mbaruku, Arumeru District Planning Officer
[9] Mutayoba, 1999
[10] See Seckler, David
[11] WaterAid Website

Table 1: Water Consumption by end-use in Tanzania and Africa as a whole [12]

	Agriculture	Domestic	Industry	
Africa as a whole:	88%	7%	5%	
Tanzania:	97%	N/A	N/A	(total urban 1.7%, rural 1.3%)

Water for domestic use is not the most consumptive use, but it is of course the most crucial to health and requires clean, safe water. Amounts of water consumed per capita varies greatly according to geographical location and lifestyle. In 1996 Tanzania was 7th lowest in a global league table of average domestic water use for drinking and sanitation per capita per day, with a figure of just 10.1 L. This is far below the 50 L figure which is recommended as a standard minimum for per capita domestic consumption per day by health experts.[13] All of the case study villages used piped or protected springs for their domestic water, which was free apart from ad-hoc repair charges. However, in at least one, some people took water from irrigation furrows (which may be polluted with pesticide residues from coffee crops), because springs were too far from their homes.

Livestock exert high water requirements: across rural Kenya, for instance, the water demand exerted by livestock is equal to 55% of the total domestic use[14]. Of course, livestock can use water sources that are generally unpotable for humans such as those listed above. However, cattle are frequently supplied with drinking-quality water, a situation which is sometimes inefficient; or in other cases are watered from unprotected sources used for domestic supply, which leads to pollution.

Irrigation is the most consumptive water use globally and within the E. Africa region. Of the total area under irrigation in Tanzania, four-fifths (120,000 ha) is traditional and small-scale.[15] In terms of these traditional schemes, water efficiencies can be very low. Traditional furrow systems lose up to 80% of the water before it reaches the fields, through seepage and evaporation. However, irrigation is an important part of the rural economy, as traditional smallholder irrigation schemes can improve food security and raise rural income levels. There is a total potential irrigation area of 1 million ha in Tanzania, of which about 60% is located in the Rufiji basin.[16] While the irrigated areas visited during the course of research were based in water-rich areas, there are instances of successful small-scale crop production taking place in drier areas, including Maasai pastureland.

[12] Africawide figures are for 1992, quoted in *Finance and Development Magazine*, June 1994. Tanzania figures are from Hirji and Patorni, 1994
[13] Wateraid Website
[14] Kaigai in Hirji et al, 1996. Domestic use is here taken to be water used for cooking, drinking and washing at household, commercial, and institutional levels. See Torori, Mumma, and Field-Juma, 1995 for livestock water consumption figures
[15] see Msuya, M.O.Y., *Rapid Water Resources Assessment*, in Hirji and Patorni, 1994
[16] "Tanzania – Country Overview" in De Sherbinin, A., and Dompka, Victoria, 1996, *Water and Population Dynamics: Case Studies and Policy Implications*, AAS

The Traditional Irrigation Improvement Project (TIP) in Tanzania works to improve the operation and management of small-scale irrigation, through technical advice and community institution-building. The technical improvements are based the use of 'intermediate technology', which is designed to make modest improvements to the efficiency of the schemes and thus improve crop yields. TIP methods bring improvements in water losses which are perhaps moderate, but they are designed to be affordable and sustainable. The policy of TIP and the Irrigation Department is to only assist irrigation schemes if the local farmers have actively sought their help and will contribute funds and labour. TIP intervenes in smallholder irrigation schemes by re-aligning canals (to increase flow speeds and benefit the overall water-distribution pattern), lining small areas with concrete to reduce seepage, and ensuring that at least one quarter to one third of the committee members are women. Often, women were not previously involved in decision-making, and they are frequently discriminated-against as regards water allocation: in one case, women were even forced to irrigate at night.[17]

Hydroelectricity also figures in the Tanzanian water sector. It is crucial to the Tanzanian economy, generating 62% of the indigenous commercial energy production.[18] The government's ultimate aim is to completely phase out thermal power plants and replace their input with hydro power. However, there are currently severe problems with siltation of dams. The Hale reservoir, for instance, has had its capacity reduced from 21 megawatts to 17MW due to loss of storage potential in the silted reservoir. This siltation due to soil run-off is ultimately caused, or at least exacerbated, by deforestation, especially on hillsides. Another problem is reduced water flows caused mainly by abstraction from rivers for irrigation systems, which are highly consumptive as mentioned above.

Water Availability

Tanzania receives annual average rainfall of 937mm, which is very unevenly distributed. Half of the total area receives less than 750mm, which is under the 760mm threshold usually reckoned to signify potential for secure rainfed agriculture. The country has areas of fairly high population concentration: 64% of the population live on just 20% of the land. Thus even in the high-precipitation areas, competition for water is intense.

Water is clearly a scarce resource, as less than 50% of the population of Tanzania has access to clean, safe water. Some sources put the figure as low as 38%.[19] However, it is wrong to assume that these problems are altogether due to a low potential for water abstraction; additionally, the capacity to utilise existing water resources is limited. Tanzania, for instance, currently abstracts only 1% of the total renewable water resources in the country. Africa as a whole uses about 4% of its total flow of available water.[20] In arid areas, particularly, there is great potential for tapping groundwater,

[17] Mr Urassa, Village Chairman, Lekitatu village, Arumeru district, Tanzania
[18] Ministry of Water, 1999, Tanzania National Water Resources Management Policy (draft)
[19] CARE Tanzania Country Profile, http://www.care.org/programs/country_profile.cfm?ID=129
[20] UNEP, undated

which is already especially significant in the central regions of Shinyanga, Dodoma, Singida, and Arusha. There are a total of 7,000 deep boreholes in the country.[21] However, the quality of groundwater varies, as high levels of minerals and salts affect some aquifers. In Arusha, some villages use water which is extremely high in fluoride, but the authorities have been unaware of this until recently. In some areas aquifers are found deep underground and require expensive drilling operations. One major limitation to further exploitation of groundwater is the dearth of information currently held about aquifers in most regions. Studies are required to assess sustainable levels of abstraction, and monitoring of all boreholes will be necessary.

In terms of existing schemes, the older ones were designed to have a limited lifespan which has been surpassed. Many supply only 10 – 20% of capacity due to leaks.[22] Some schemes were also designed without treatment works, as water quality at the time of implementation was good. Many of these problems are not taken into account when levels of water demand and supply are estimated, so that current estimates may be optimistically high.

Areas which are extremely arid and which have minimal opportunities for groundwater exploitation require a combination of systems such as earthdams, sub-surface dams, and domestic rainwater catchment structures.

However, Tanzania cannot rely on new water schemes to solve its water supply problems. Studies show that the costs of new water projects tend to rise in terms of construction costs per unit of water supplied. For instance, water systems funded by the World Bank in Zaire in the early 1970's supplied water at a cost of US $ 0.60 per cubic metre, but by the early 1980's this figure had jumped to over US $ 1.80 per cubic metre. This increase can be explained by a number of factors including the increasing remoteness of sources being tapped, and the need for more complex supply systems. Therefore, it may prove more cost effective in the long run to invest in training and conservation measures which help to make water distribution more efficient and equitable. This is the opinion of many water specialists[23] and forms the basis for the decision to focus on managerial and institutional aspects, rather than technical aspects, in this paper. At the same time, it is important not to underestimate the need for the development of new water systems, especially in semi-arid areas.

Tanzania faces many challenges in the task of improving the managerial and institutional context to water supply. The inequality in distribution of water resources across the country is one physical limitation. Most of the water sources originate from 'islands' of water abundance, such as Mt Meru and Mt Kilimanjaro. In these areas, the apparent abundance of water – at least during the rainy seasons – can lead to poor motivation to conserve water. If water use can be managed efficiently, more water will be freed for use by people downstream. Water availability is often very low, just a few miles from the water-rich highland areas.

Moreover, the continued availability of water depends on the conservation of forests and the use of soil and water conservation technologies in people's farms. As more water is diverted away from the groundwater store as run-off (due to replacement of forested land with cleared fields), springs and other water sources provide diminishing

[21] Msuya, Meraji, 1999

[22] Interview with Mr Lyatuu, acting Arusha Regional Water Engineer, 23.4.99

[23] This viewpoint was strongly made by many participants at the ACTS workshop on water policy, for example.

yields. This is a particularly difficult challenge, as population pressure on the land in these high potential areas is high and is continuously rising.

Pollution is also a grave problem. Faecal contamination of water sources (including groundwater if the water table is sufficiently high) may be common: one official source states that 95 percent of the water sources in Tanzania are bacterially contaminated[24], although it seems likely that this figure either refers to minor (rather than gross) contamination, or to surface water sources only. The use of pesticides, particularly on coffee and flower farms, is another serious threat, and current legislative and (especially) enforcement instruments are inadequate to deal with the problem.

The next section looks at the governance institutions which are responsible for managing this increasingly scarce resource, and avoiding some of these problems of poor operation and maintenance, and degradation and pollution of water sources.

State and Indigenous Governance Institutions and Water Management

"There's a very high problem between traditional leaders and the village councils. All of them are servicing the community, but there's no demarcation of boundaries, so that some people support one type of leaders while other people undermine them. There's a lot of confusion in these villages."
Mr. Amani Saning'o Lukumay, Kammama Integrated Development Trust Fund

The interaction between indigenous institutions and state institutions in East Africa has led to a great variety of authority-units which have an influence on natural resources management. In the Ruaha River Basin, Tanzania, at least 12 types of institutions which govern land and water management were identified[25]. These institutions have different amounts of influence amongst separate communities, age-groups, socio-economic groups, and in different political situations.
The relative influence of some of these institutions in Arusha district is discussed below.

The Village Council System

The structure of the village government system in Tanzania is, briefly, as follows:
The village assembly, which consists of all persons aged 18 and over, elects members of the village council. Each village has a number of committees, some of which are 'mandatory', but all of them may be more or less active. At present in Arusha region, about 50% of villages have a water committee. In some cases Water User Associations (WUAs) may exist outside the committee system, and these may or may not have strong links with the Village Council. The official Ministry of Water policy

[24] National Environment Management Council (NEMC), 1992
[25] See See Bosen, Mganga and Odgaard, *Rules, Norms, Organisations and Actual Practices- Land and Water Management in the Ruaha River Basin, Tanzania* in Granfelt, 1999

is that a village is ineligible for state funding for water projects unless it has a WUA or water committee.

Most of the respondents saw the village council system as having great potential as an institutional framework for village governance and development. However, many people commented that the responsibilities or development targets of the village leaders are frequently poorly defined. Some councils are 'inactive' and have to be 'revived' by community development organisations[26]. According to some commentators, village councils "have a poor overall record in the management of community-owned resources."[27] However, the effectiveness of this institution varies according to the individuals involved and there are many examples of hard-working, motivated village councils.

It is possible that the importance of water is under-emphasized during village council meetings because of the dominance of men in many of the councils. The Water Law states that at least half of all Committee members must be female, although this isn't always the case in practice. Furthermore, "often [women's] involvement is limited to mandatory representation, for example on user committees, with the inherent danger of increasing demands on women's time without actually giving them a voice."[28]
To avoid this trap, "women need to be in key positions to be really effective".[29] Women, who tend to contribute more labour-time to water-related activities, are perhaps more likely to press for improvements to water systems. However, it is important that water committees are not seen as 'women's business', in case men withdraw their support, which can be crucial especially in terms of financial contributions.

The financial situation is one incentive for the trend of hand-over from the state to the communities, as the responsibility for enforcement of water regulations then falls to them.[30] The costs that village councils, the traditional village elders, and other local people may incur in policing the system are generally social costs, rather than financial. For instance, those reporting a wrongdoer can face unpopularity from a section of the village, and may even be threatened with violence. However, these kinds of social costs, as well as the time involved in monitoring other people's actions, are not highly valued by policy-makers. Thus local systems can be seen as 'free', when in fact heavy social costs can be incurred. Policy-makers should not put the burden for natural resources management on the shoulders of the local population without putting ample mechanisms in place to support and reward people.
As regards the involvement of the village councils in water committees, opinion is divided over the amount of control that the local authorities should have. Some NGOs have found the sub-village level to more successful in water management, for instance because the smaller unit (all members are truly 'neighbours') allows easier collection of contributions. The Village executive may be "too closely linked to local politics" to

[26] Interview with Joyce J. Mwanga, WEGCC co-ordinator, 21.4.99
[27] Mascarenhas and Veit, 1994, pg. 17
[28] UNDP/World Bank Water and Sanitation Programme website, *Voice & Choice for Women* http://www.wsp.org/English/index.html
[29] Mr Mushi, Hydrologist, Arusha Region.
[30] EPIQ, 1999

be impartial.[31] Some experts point out that a water source may not be used by the whole village, and thus the village council doesn't have legitimacy in controlling it.

Indigenous Social Institutions

With over one hundred and twenty ethnic groups in Tanzania, the nature and power of indigenous local institutions varies considerably from place to place.
It is however possible to generalise that many have changed considerably since Independence: "villagisation… led to the undermining of traditional village leadership"[32]. Water groups which have evolved from customary practices may exhibit a greater degree of institutional cohesiveness than groups which lack such a foundation. For instance, *kualika* labour, a form of agricultural work-sharing whereby groups of people farmed each member's shamba in turn, may form the basis for other institutions, such as water groups. The group consisted of extended family and close neighbours.[33]

Furthermore, indigenous institutions can provide useful local mechanisms for the resolution of land- and water-access conflicts, although they may require legal support to ensure enforceability. In Tanzania, some village-level indigenous systems have been so successful at dealing with local conflicts that the state courts have been moved to another area due to lack of demand.[34]

However, there are a number of problems within the Tanzanian context. The location and extent of village lands are not always in accord with cultural boundaries, so that: "In the context of the modern village committees (which are frequently ethnically heterogeneous) appropriate [indigenous] models for management of common property are not widespread."[35] In other words, if a village consists of more than one cultural group the various different indigenous institutions (e.g. customary courts) may have ceased to be effective, as none had power over more than a segment of the village population. This is the case in the example of land and water tenure conflicts in the Ruaha River Basin, mentioned above.
Often greater urbanisation and adoption of more 'modern' cultural elements can lead to the weakening of traditional management institutions, and the migration of young men - who are usually at the forefront of population movements – means that the elders have fewer people to enforce the decisions that they make.
When traditional management regimes breakdown, disputes over access to land and water can sometimes become violent. In many places, there is competition between the village council and the traditional leaders and institutions. Sometimes, local people will boycott the village council system over specific issues in favour of more indigenous management systems, and the village councils may be powerless.[36] On occasion, a village council will show little interest in the workings of a water users

[31] Roger Yates, Oxfam Tanzania, speaking during the ACTS workshop on water policy
[32] Mascarenhas and Veit, 1994, pg. 17
[33] Mascarenhas and Veit, 1994, pg. 12
[34] Interview with Dr Fanuel Sechamba, Institute of Resource Assessment, and George Jambiya, Geography Dept, University of Dar es Salaam, 19.3.99
[35] Bergin, Patrick,1996
[36] Interview with Dr Fanuel Sechamba, Institute of Resource Assessment, and George Jambiya, Geography Dept, University of Dar es Salaam, 19.3.99, and Interview with Mr. Amani Saning'o Lukumay, 22.9.99

group until they realise that the group has money in the bank for repairs. In such cases there is a risk that the village council will take over and 'eat the money'. In such cases, a meeting organised by a neutral facilitating agency may be necessary to make any mediation measures credible.

Conflict in the Case-Study Areas

There are countless instances of competition over natural resources leading directly to violent conflicts in East Africa and of course all over the world. In the water sector, there are specific examples from Marakwet in Kenya of thefts of water through the secret diversion of irrigation furrows leading to violent quarrels and many deaths over the years. It is also possible that disputes over water access can act as catalysts, or as 'justification' for interclan or tribal conflicts. One case recorded in Tanzania illustrates the often complex nature of conflicts over water.

Until the late 1980's, the high level of fluoride in the springwater used by the villagers of Oldonyowas was unrecognised. However, water analysis revealed levels of around 20ppm, compared to the WHO recommended standard of 1.5ppm. In 1990/91 local people located a spring, some 15 km away. They requested assistance from MS, the Danish volunteer service, and received advice on how to proceed. In 1993/94 they paid Ministry of Water staff to test the new source, which contained only 3.5ppm of fluoride, and applied for a Water Right. The application process took 3 months and involved the usual process of official notice being published in the local newspapers, and the Ward Development Committee (which represents Oldonyosambu and other villages as well as Oldonyowas) met with the hydrologist before the go-ahead was given.

With the assistance of M.S. and the Ministry of Water, the villagers calculated the cost of a pipeline from the spring to the village: about 120,000,000 Tsh (about $165,000) including labour and equipment costs. Villagers raised about 2,200,000 Tsh (about $3,000) and worked in teams of 60 per day for two days per week during the course of a year, digging trenches for the pipeline and laying the pipes. Those who had salaried jobs and could not labour paid 5,000 Tsh per month (about $7) towards the cost of the project. The women of the village prepared food for the workers.

Soon after work had started, *moranis*[37] from Oldonyosambu destroyed the sections which had been completed. The Oldonyowas village council and traditional elders started talks with their counterparts in Oldonyosambu, which lasted for almost a year. Finally they got permission to continue from these village representatives, and work recommenced. After another year or so of construction work, the pipeline was completed. Then, three days before the scheduled opening day, *moranis* again destroyed the system. The *moranis* from Oldonyowas prepared themselves for some kind of battle with the opposing group, but were dissuaded from doing so by the village council and their traditional elders.

Further meetings were held between the traditional leaders and village council officials from each village, and a number of objections to the scheme were voiced by the Oldonyosambu group. These included the idea that the pipeline would severely

[37] Young men of the 'warrior' age-set

reduce the water flow in the pipe used by the Maasai in the plains, which is contested: the water right was allocated after a hydrology study, which should have ensured the plains supply was maintained. However, some local people claim that water levels in the pipe used by the Maasai fell dramatically. A counter-claim is that this pipeline is in urgent need of repair so that much water is lost before it reaches the watering-point. The lack of storage facilities on the plains also leads to a lot of water wastage. Ministry of Water official mentioned that the hydrologists didn't study a wide-enough range of water users when allocating the water, and may have devalued the interests of the pastoralists because of their geographically 'marginal' position. When hydrological studies are being done, it may be wise to involve legitimate local representatives from surrounding areas in order to avoid this cloud of misinformation that frequently surrounds such disputes. As MS state, "Part of the problem seems to be because of lack of sufficient information – and in some cases deliberate mis-information – on the effects of the changes in the distribution of water to the various users down the stream." [38]

The main issue however was that they apparently thought that money from the district Annual Development Levy (collected from every household in the village) had been used to fund the project. Indeed, the vandalism apparently occurred immediately following the release of some *morani* after their arrest for demonstrations against the Development Levy. The Oldonyowas village council think that some of the motivation for the destruction may have been political: their theory is that people were causing unrest in order to destabilise the powerbase of the local M.P. or other politicians. Discussions were held to try to resolve the situation, and were sometimes chaired by the Regional Commissioner or the District Commissioner. As a result, the Oldonyosambu group agreed to let the Oldonyowas pipeline operate, if the Oldonyowas villagers undertook repairs to the Oldonysambu pipe which leads to the plains, and constructed a storage tank for the use of the Maasai and their animals. It seems as if Oldonyowas may provide the other group with a storage tank and some pipes if the Oldonyosambu group contribute some money in return. However, this course had not been finally decided on at the time this paper was written.

This example demonstrates a number of things. Most significantly, it shows that the Water Rights process is not seen as 'legitimate' by some people: the opponents to the scheme do not care that official permission has been granted to abstract water. If they had been better informed and involved in the process of Water Rights allocation, they might have respected the decision.

Secondly, this example demonstrated that the conflict resolution process has not been successfully institutionalised by the District Council, the Ministry of Water, or other Ministries. There is a need for an 'independent' authority with some measure of local legitimacy to mediate in the process.

The main lesson from this case study should be the sheer level of wasted time, effort, and money that can result from such disputes. Securing access to water which has local legitimacy as well as legal status is vital for the success of water projects.

Policy Issues

[38] *Tanzania Annual Report 1998*, MS website, http://www.ms-dan.dk/uk/

"The water policy should be treated in the same way as the White Paper on the Constitution. In fact, discussions on the water policy are even more important than the political changes"
Mr. Nasari, Regional Hydrologist, Arusha

Clearly, technical considerations are important in the water sector, particularly in terms of identifying affordable and manageable 'intermediate technologies'. "Participation cannot substitute for technology that does not work, geology that is difficult, and climate that is unco-operative".[39] Improvements are particularly necessary in most traditional irrigation schemes to reduce seepage losses. The best practices in this area should be identified by the Traditional Irrigation Improvement Project (TIP), and similar projects and disseminated widely. Rainwater harvesting is another relatively low-cost technology that holds promise for the arid areas.
However, this paper has attempted to demonstrate that technical aspects generally only deal with the symptoms of more fundamental problems. Some of the key problems affecting the Tanzanian water sector have been identified above. Crucially, there is a risk that the withdrawal of the state from its position as a provider of water for communities will lead to an institutional 'vacuum'. Communities that are poor, remote, and organisationally unprepared to plan, implement and manage a water scheme will suffer as a result.

In terms of cost-recovery in water institutions, it is clearly necessary to charge for water. However, it is important to separate water uses and prioritise them into what may be called 'social goods' (essential uses, e.g. domestic use) and 'economic goods' (e.g. irrigation, other commercial uses). While it is important to give local communities some autonomy in managing water, it is also important to regulate use to encourage conservation for other communities' benefit, and to avoid the local elite from benefiting at the expense of the poor, by effectively subsidising irrigation water, for instance. It has been shown that when water is provided at a fee, women are less likely to use it as they generally have less access to cash than men.[40] Also, "it would seem that people are less likely to revert to polluted surface water sources during the rainy season where [domestic] water is not paid for by the bucket"[41] Thus the concept of a free 'lifeline supply' of water for domestic use recommended in the draft water policy should be made law, and should be properly enforced.
Additionally, the demand-oriented approach, which focuses interventions in areas which request assistance, runs the risk of failing to meet the needs of communities which have low capacity for fund-raising and communicating with outside agencies. To mitigate this problem, "A major effort should be undertaken to raise awareness of the various sources of funds and mechanisms in remote and isolated areas".[42]
As regards disputes over water, misinformation is often a factor in resentment amongst users of shared water schemes. Thus an awareness campaign must also include details of the water permit policy and the reasons for exacting water charges.

[39] Castillo, Gelia T., in IDRC, 1987, *Women's Issues in Water and Sanitation*
[40] Torori, C.O., A.O. Mumma, and A. Field-Juma, (1995, *Governance of Water Resources in Kenya*, ACTS Press/Initiatives Publishers
[41] Evaluation of WaterAid's work in Tanzania, January 1995, see http://www.wateraid.org.uk/reports/wamma1.html

[42] UNDP/World Bank Water and Sanitation Programme website, *East and Southern Africa Region: Demand Responsive Approaches to Community Water Supply*, http://www.wsp.org/English/index.html

It is important that local authorities and NGOs disseminate clear statements regarding water and general development policies. This requires regular briefings for extension staff and use of mass media, where appropriate.

One of the main tasks in the two existing River Water Basin areas is to include more stakeholder participation in the Water Boards. At present, five of the ten members of the Water Boards are from Government, "while the rest are from parastatals and other stakeholders"[43], and it is doubtful whether any of these 'other stakeholders' are legitimate representatives of small-scale irrigation. One way of doing this is to have a structure of 'nested' institutions which allows a flow of communication and sufficient representation of the interests of the many interest-groups. There is a potential gap in communication and in ties of responsibility between the users and the high-level organisations such as the Basin Water Board, unless bridging institutions can work to ensure that all stakeholders are represented. It is important to that policy-makers examine the constraints to participation by local communities and their representatives and create a genuinely enabling environment for negotiation between all stakeholders. Common constraints include the amount of information which is available to stakeholders: all water users should be educated about their rights, of their responsibilities and those of other water users and regulatory bodies, as well as being kept informed of relevant fora for discussion and participatory policy-making, and changes in the law. Popular participation in policy-making depends to a great degree on the abilities of the stakeholders to understand the 'rules of the game': to be able to stand up for their rights, negotiate, present their views clearly, and utilise all the potential mechanisms for intervention in the policy-making process. It may also be the case that many Tanzanians are not yet comfortable with the idea of 'challenging' the views of the authorities, because of the controls previously imposed on society by the one-party state, as, "For thirty years TANU/CCM sought to undermine any basis of social organisation outside itself."[44]
For this reason, participatory mechanisms must aim to *actively* support the ability of citizens to present their views, particularly those representing the interests of the many small-scale farmers who make up the vast majority of water users.
'Umbrella' organisations could bridge the gap between the individual water users and the Basin Water Boards. For such institutions to be effective, they require legal status and a well-defined role in the management of basin-wide water resources, with access to formal channels of discussion and decision-making. The presence of NGO staff in a training and 'watchdog' role could be very useful. It is also important to take all the costs of such an organisation into account: there are financial costs in terms of travel to meetings as well as 'transaction costs': the value of time and effort put into meetings and information gathering, etc. If an institution charges water users to recoup its costs, it must demonstrate its usefulness to individual water users. Another issue of great importance is the membership of the organisation: whether it is open to those with customary, rather than legal Water Rights. A mechanism for dialogue with 'illegal' water uses should be developed. Involving them may also be an effective way of ensuring that they apply for a Water Right during the proposed two-year 'grace' period.

[43] Mutayoba, 1999
[44] Costello, 1996

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